JANUARY 30, 1995 VOLUME 17, ISSUE 5 *Founded in 1978*

INFOWORLD

The Voice of Personal Computing in the Enterprise

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Get hooked: *How to find a reliable Internet service provider that's right for your business needs.* 51

Pentium now, VLIW later

Memphis, VLIW future for Intel, Microsoft

By Brooke Crothers and Jason Pontin

THE "NEXT BIG THING IN COMPUTERS" is expected to be Very Long Instruction Word (VLIW) systems, as Hewlett-Packard Co., Intel Corp., and Microsoft Corp. are developing products based on the 64-bit technology that could appear as early as 1997.

Microsoft is tailoring its nascent Memphis development effort to take advantage of VLIW processors, such as the 64-bit processor Intel and HP are working on,

▷ **VLIW** *page 20*

Chips fly in full-court Intel processor press

By Brooke Crothers

WITH ITS FLOATING-POINT PROBLEMS under control, Intel Corp. is moving ahead on a number of fronts.

While Intel delivers samples of the 120-MHz P54CS Pentium into the hands of major OEMs, it is also preparing to push forward into next-generation P55C Pentiums.

Intel is also expected to introduce on Feb. 16 the P6 processor, the successor to the current Pentium design.

▷ **INTEL** *page 20*

Users slam Sybase pricing

By Mike Ricciuti

SOME SYBASE USERS are up in arms over a Sybase Inc. service contract policy that looks to some observers like a "bait and switch" tactic and that even Sybase officials concede needs to be changed.

Sybase requires purchasers of its Workgroup SQL Server database, released last fall, to pay $4,000 or 30 percent of the software purchase price — whichever is higher — for a service agreement. Users argue that while Sybase's service has been top-notch, the price is too high.

Sybase's competitors, Microsoft Corp. and Oracle Corp., offer service requirements with comparable terms for a comparable cost (see chart, page 20). But they do not force their users to purchase a full service contract and they offer a much wider range of service plans starting at lower prices.

Many users have also complained recently in on-line forums that the Sybase policy misleads customers

▷ **SYBASE** *page 20*

Gupta ranges farther afield with SQLBase

By Mike Ricciuti

GUPTA CORP. NEXT MONTH will launch a revamped, three-tiered lineup for its SQLBase database, including a version for embedded systems and mobile users.

The SQLBase upgrade is the first step in Gupta's plans to reposition the database as a deployment tool for server-based and mobile applications built using its SQL-Windows development tool, the company said.

As expected, Gupta will announce SQLBase 6.0 in an enterprise version bundled with an updated SQL Console system administration tool, priced from $995 for a five-user license to $9,995 for an unlimited user package. The database is aimed at other workgroup-level databases from Oracle Corp., Sybase Inc., and Microsoft Corp.

Gupta will also ship SQLBase Ranger, a version of the database designed for embedded systems, mobile environments, and laptops.

▷ **GUPTA** *page 20*

Apple opens up to Windows

■ OpenDoc key to porting Mac features

By Nicola Miner

IN AN EFFORT TO LURE ISVs, Apple Computer Inc. intends to use OpenDoc to put its most powerful features — such as QuickDraw GX — on Windows.

Using OpenDoc to bring new technologies to the Windows and Macintosh platforms could be key to Apple's ability to maintain a viable developer base against Microsoft Corp.'s overwhelming market presence, analysts and developers said.

"We had a problem in how to bring our technology to other platforms, such as Windows. OpenDoc is one way to establish our technology on those platforms," said David Nagel, senior vice president of the AppleSoft division within Apple.

The lack of cross-platform

▷ **OPENDOC** *page 8*

PRODUCT COMPARISON

Some Internet servers made it easy, and some made us queasy.

Joining the Internet

Virtually everything about our Internet server comparison was a surprise, including how hard it was to use and administer some of these products, despite their marketing claims. But the biggest surprise was that BBN Internet Services' BBN Internet Server, a near-unknown newcomer in the hardware world, overcame venerable Sun's Netra.

Both products are brand-new combinations of hardware and software

▷ **SUMMARY** *page 69*

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Lotusphere demonstration

Lotus unveils Notes 4, releases new client

By Doug Barney

(ORLANDO, FLA.) LOTUS Development Corp. unveiled the first full-featured version of Notes, Release 4, here at its Lotusphere conference last week, along with a strategy to dramatically expand the market for its flagship product.

Lotus announced another cut-price client for Notes and showed off a number of new features in Release 4 designed to improve ease of use and lower the cost of ownership for Notes users. The company also announced a range of enhancements to encourage deployment of Notes across large-scale, geographically dispersed networks.

The new Notes Desktop client allows access to any Notes application, unlike the earlier Notes Express client, which limited users to four basic application types. However, it provides none of the development features in the standard Notes client. It will ship this quarter for $155. Lotus also announced a $55 price cut for the full Notes client, reducing its price to $275.

The $99 Notes Express introduced last year, which does have database design capabilities, has not met with approval.

"Express was a big letdown [because of its limited application support]. We had planned a corporatewide rollout," said Ted A. Pichalski, an IS staff member at GPU Service Corp., in Parsippany, N.J. Notes Desktop's pricing may help GPU move more of its 10,000 employees to Notes; currently 3,000 have Notes. "Notes Desktop might help us go all the way," he said.

Notes 4, which Lotus officials said will support up to three times as many users per server as the existing 3.x version, was greeted enthusiastically by the 6,000-plus attendees at Lotusphere in Orlando, Fla. It is scheduled to ship midyear, at a price yet to be announced.

A 90-minute demonstration revealed an array of new user interface features, including new ways of organizing Notes Views, improved workflow with a new feature called Actions, better document linking with Notes and other data sources, and a new "three-pane interface," similar to the interface in Lotus' cc:Mail, that allows users to display multiple views of the same Notes data at different levels of detail. The Release 4 interface also includes an integrated Internet Web browser to enable users to access the Internet via Lotus' InterNotes product.

Lotus also promises more efficient use of storage and network resources. Release 4 will offer a "single-copy message store." If a message with attachments is broadcast to a large number of users, the system stores one copy and provides users with pointers to the message. Additionally, selective field-level replication in the product reduces the amount of data transmitted over the network or phone lines.

Lotus has also added a number of features for mobile users, many lifted from cc:Mail Mobile. For example, users can configure the client to support multiple locations. Each location has its own dial rules, home server, phone numbers, and billing information. The system will even remember what database was last accessed from that location and offer a quick connection to that data. In addition, one phone number can be used to reach all servers.

Mobile users also get more efficient replication can configure replication on a per database basis and can determine the order in which data is replicated, whether to send or receive changes only, what documents to replicate, and whether just a subset of the documents should be replicated.

Why would OpenDoc make a difference? Because 1995 could be the Year of the Objects, and interoperable objects will lay the foundation for distributed object computing.

The players in this race are OLE and OpenDoc. And while OLE currently leads the mind share (and to a large extent development) race, many believe OpenDoc is going to win its share of ISV support because of its feature set. The fact that Microsoft has eased restrictions on OLE compatibility — allowing ISVs to attain OLE functionality through OpenDoc (and thus get the coveted Windows 95 compatibility logo) — certainly makes OpenDoc more attractive to developers.

So if an ISV can exploit QuickDraw GX to get faster printing, for example, and do this without additional work because of Apple's efforts, then it might be a win-win situation for both sides.

Let's hope Apple's strategy takes hold and this time developers are willing and ready to exploit the technologies Apple builds.

Write to me at jai_singh@infoworld.com or via MCI at 520-1152.

FROM THE NEWS DESK · JAI SINGH

Apple's field of dreams — OpenDoc

Build it and they will come. In Apple's case this aphorism should have worked. This, after all, is a company renowned for building many firsts in the PC industry — from the GUI to 3.5-inch floppies to plug and play, and so on.

Apple, however, has been experiencing serious code drain. Developers have either pulled back or totally abandoned the Mac platform in favor of Windows. Needless to say, attracting Windows developers has been an uphill battle.

Even Microsoft, which is the leading Mac developer, takes a poor-cousin approach to the platform. Mac applications come out months after the Windows versions and in many cases aren't ready for prime time, as the recent Word for Mac controversy shows.

Now, though, it appears Apple might have figured out a way to turn developers on to its cool technologies. As we report in our page 1 story, Apple intends to bring new technologies to the Windows front via OpenDoc. For ISVs, this means a simplified approach to cross-platform development. Apple is betting on this approach to stem defections and win over new developers.

BORLAND SET TO LAUNCH TWO VERSIONS OF DELPHI

AT DEADLINE

Borland International Inc. will launch its Delphi development tool on Feb. 14 at the Software Development '95 trade show in San Francisco, said sources close to the company. Delphi will ship in two versions: Delphi Client/Server, which will be bundled with Borland's Interbase 4.0 database server for Windows NT and NetWare, and a desktop version of Delphi bundled with the Local Interbase engine, a Windows 3.1-based 16-bit version of the database. Delphi will hit store shelves by March 1, sources said. Separately, work on a planned line of decision-support tools, code-named Data Pump (see "Borland readies decision-support package," Nov. 21, 1994, page 3), has been put on hold, sources said. The company is cutting back on development projects as part of its restructuring. Borland last week reported an even greater loss for its third quarter than expected. It posted a net loss of $22.9 million on revenues of $48.1 million, a decline of nearly 40 percent over the same period last year.

INTEL CHANGES POLICY ON CHIP FLAWS

Intel Corp. promised last week that it would be more open about revealing processor flaws to the public, in response to criticism about the way it handled the recent Pentium flaw. Intel, however, will still require individuals and companies to sign nondisclosure agreements in the early stages of flaw reporting. Intel will make two basic changes to previous practices. It will refrain from making "technical Judgements" about whether "somebody should know about [the flaw] or not," said an intel spokesman; If intel finds any flaw it will always make the disclosure. Second, the company will publish flaws, or "errata," on a quarterly basis and will make them available to the public. intel also said that, if necessary, it will make more timely disclosures of flaws to the public. "Our policy now is to err on the side of prerelease," said Carl Everett, general manager of intel's Microprocessor Products Group. People who find flaws should call (800) 628-8686. Intel also has plans to make processor steppings (versions) easier to identify.

FORE, NORTHERN TELECOM TEAM UP

Fore Systems Inc. announced last week at ComNet '95 an agreement where by Northern Telecom Inc. will use Fore's Fore Thought software in its Magellan Passport and Concorde Asynchronous Transfer Mode (ATM)-based switches. The move will extend the capabilities of Fore's existing backbone ATM switch to the wide area through the Northern Telecom wide-area access switches. The Fore software supports switched virtual circuits, LAN emulation, optimized routing, and link load balancing. Fore and Northern Telecom also pledged to introduce a number of new undisclosed WAN features and products for delivery this year.

BRIEFLY NOTED: ▶ **AT&T and LANNET DATA COMMUNICATIONS LTD.** are negotiating a deal under which AT&T will resell Lannet chassis-based and stackable switching hubs and associated modules throughout the United States. ▶ **MACROMEDIA INC.** this week announced it has added IBM's OS/2 Warp to its list of multimedia platforms. OS/2 Warp joins Windows, Macintosh, Microware OS/9, 3DO, and Online Media as platforms for its Director Player, which provides multimedia playback technology. By using Director Player for OS/2 Warp, any title developed on Director 4.0 for Windows or Macintosh can be transferred for playback on OS/2 Warp. The Director Player for OS/2 Warp will be available this summer. ▶ **OMEGA RESEARCH INC.** will ship next week the $69.95 Wall Street Analyst for Windows, which allows users to chart stocks, bonds, and mutual funds. ▶ **MODATECH SYSTEMS INC.** will ship in April a new version of its contact manager Maximizer for Windows 3.0. New features include Vendor independent Messaging and Messaging API E-mail support, a rolled-in word processor with OLE support, and a new user interface. Pricing has yet to be announced.

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POSTAL INFORMATION: Second-class postage paid at San Mateo, CA, and additional mailing offices. InfoWorld (ISSN 0199-6649) is published weekly, except for a combined Christmas/New Year's issue, by InfoWorld Publishing Company, 155 Bovet Road, Suite 800, San Mateo, CA 94402; (415) 572-7345. InfoWorld and Enterprise Computing are trademarks of InfoWorld Publishing Company. Copyright 1994 by InfoWorld Publishing Company. All rights reserved. Reproduction of material appearing in InfoWorld is forbidden without written permission. The price of a one-year subscription to InfoWorld is $150 for subscribers in the U.S. and $145 in Canada. POSTMASTER: Send change of address to InfoWorld, PO. Box 1172, Skokie, IL 60076. InfoWorld subscriber services may be reached at this same address or by calling (708) 647-7935. Printed in the U.S.A.

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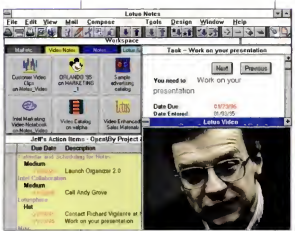

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This One

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Triton supports fast EDO DRAM

■ Intel foresees cacheless Pentium systems using EDO

By Brooke Crothers

INTEL CORP. announced last week the Triton PCI chip set for Pentium processors. Triton should lead to less expensive Pentium-based PCs that can match the performance of current high-end systems.

The chip set is designed for use with the 75-, 90-, and 100-MHz Pentium processors.

One of the main attractions of the Triton is its support for fast Extended Data Out (EDO) DRAM.

EDO is a new memory technology designed to deliver memory performance as fast as that found on PCs that use more expensive static RAM (SRAM) for their second level memory caches.

EDO memory is now being offered in limited quantities by companies such as Micron Semiconductor Inc., Samsung Corp., and Toshiba Corp.

Intel says the chip set is now shipping in volume and that systems using Triton-based PCs should appear by the end of February.

However, one industry source familiar with the chip set says there is a "showstopper" of a flaw in a version of the chip set and volume shipments won't begin until May or June.

But other industry sources deny this, saying bugs have been worked out of the shipping chip set.

Improved, less expensive Pentium systems coming with Triton PCI chip set

- Cacheless Pentium design
- Support for fast Extended Data Out DRAM
- Integrated PCI IDE controller
- 100MB throughput between PCI and DRAM
- Enabling of Native Signal Processing
- Enhanced Plug and Play support
- Support for pre-emptive multitasking in Windows 95

Intel foresees cacheless Pentium systems using EDO memory, which can reduce system prices between $150 and $200.

But some dispute this.

"There is a big price difference between EDO and [standard DRAM], and we don't see that much of a speed boost," said a source at a major motherboard manufacturer that plans to use the Triton chip set.

But analysts think EDO could prevail.

Just as there is a preponderance of low-end 486 systems that use no Level 2 cache, so will some low-end Pentium systems be cacheless, said Mike Feibus, a principal at Mercury Research, in Scottsdale, Ariz.

The chip set also comes with, for the first time, a built-in IDE controller, and it supports Bus Master IDE, which can result in higher throughput IDE subsystems.

Triton also supports pipelined burst SRAMs that offer the performance of next-generation SRAMs at a lower cost.

Triton delivers a data transfer rate of 100MBps for data transfers between memory and the PCI bus.

The chip set's support of Native Signal Processing will also enable vendors to implement digital signal processing directly on the Pentium processor.

The chip set is priced at $41.95 in 10,000-unit quantities.

Messaging-system software

Collabra Share gains discussion threads

By Doug Barney

COLLABRA SOFTWARE INC. will announce next week a new version of Collabra Share designed to support threaded discussions and provide access to the Internet.

Version 2.0, which will still work with existing file sharing messaging back-ends such as Microsoft Mail, will offer threaded discussions and Internet access via agents. The upgrade will be integrated with Microsoft Exchange and new versions of Lotus Notes and Novell GroupWise, scheduled to ship by year's end. Sources within Collabra confirmed details of the announcement but not a ship date.

The Collabra Share architecture will still be based on Forums, which make use of the discussion group metaphor. These Forums will now offer threaded discussions and the capability to generate thread summaries.

Armed with such a summary, users can skip over items of less interest and jump to contributions they want to read.

Users can also contribute to Forums anonymously or reply to postings privately. In addition, a red flag will alert users to new postings.

Through enhanced remote support, mobile users will be able to access and replicate information in the same way as LAN clients.

Collabra Share will also be more fully integrated with both the Internet and Lotus Notes. An Internet agent will connect Share to Internet news groups and through bidirectional replication will import discussions and ship back contributions to the Internet.

"There are replicator agents that would replicate the news groups," said a source familiar with the product, who added that news-group threading remains intact.

The new version of Share will also support bidirectional replication with Notes databases, allowing users running Share on other platforms to interact with Notes.

Share will now be more tightly integrated with the messaging system on which it is running.

The product, which used to have its own directory, will now use the directory of the back-end mail system. It will also provide users with a single log-in, so that Share is launched when a user logs on to E-mail.

Share will include a spelling checker and several new editing tools, such as indents and bullets.

Novell SMP delayed until middle of year

By Paul Krill

SHIPMENT OF Novell Inc.'s long-promised symmetric multiprocessing (SMP) version of NetWare has slipped again to mid-1995.

Failure to release the product leaves NetWare at a continuing disadvantage to Microsoft Corp.'s Windows NT in the market to provide a platform for compute-intensive distributed applications.

Originally promised as long ago as 1989 and most recently due by the end of 1994, NetWare SMP support is now scheduled to ship this summer, according to Novell officials.

Novell outlined in March 1994 plans for the introduction of NetWare SMP support in a three-phase strategy dubbed Distributed Parallel Processing. Support of an SMP kernel in NetWare 4 will be the first phase and will balance NetWare operations across multiple processors. The next phase involves enabling NetWare Loadable Modules to run in separate domains within the server and be load-balanced to multiple processors. The final phase calls for support for massively parallel processing and clustering of separate hardware systems.

Novell officials attributed the delay to having to wait for commercial shipment of NetWare 4.1. The new version of NetWare was needed for SMP development to proceed, said Bill Mason, director of partner marketing for Novell's NetWare products division, in Provo, Utah. NetWare 4.1 began shipping in December 1994.

Also having an effect on the development of NetWare SMP is the need to develop specific interfaces for each Intel hardware vendor planning to support NetWare SMP, Mason said. These interfaces are called Platform Specific Modules, and development is still in progress.

The failure to provide SMP support in NetWare yields a critical competitive advantage to products that have it, such as Windows NT, OS/2, and Unix, said industry analysts.

"There is a certain set of customers that sees multiprocessing support as a big issue," said consultant Jamie Lewis, president of the Burton Group, in Salt Lake City.

Large corporate customers want to deploy line-of-business applications on LANs and want the performance of SMP and pre-emptive multitasking, Lewis stressed.

"[SMP] is one of the factors contributing to interest in NT in large corporate accounts," Lewis said.

Mason denied NetWare has lost any market share because of its lack of multiprocessing support, despite testimonies suggesting a negative impact on market penetration.

The lack of SMP in NetWare recently prompted a New York brokerage firm to eliminate it from consideration for a real-time trading and financial derivatives application. Windows NT was chosen instead.

"NetWare's just a network operating system, and it really doesn't take advantage of SMP," said Carl Carrie, vice president of derivatives research and technology at Tullett & Tokyo Forex Inc.

"It's inappropriate" for the firm's complex application, Carrie explained.

Joyce Ronemous, president and CEO of The Productivity Center, in Houston, and a systems developer in the Windows NT and Novell environments, said she has seen a move by some customers, including a large oil company, from NetWare to Windows NT because of multiprocessing. But most customers with large investments in NetWare are likely to stay there, she said.

Lee Barckmann, analyst at the Oregon Department of Public Works, said multiprocessing would not at present be a benefit to the organization. It could be in the future, however, if the department fully migrates its CAD and other applications to a client/server environment, Barckmann said.

Lotus to ship HiTest Tools for Visual Basic this quarter

By Doug Barney

(ORLANDO, FLA.) Lotus Development Corp. announced a range of Notes add-on products here at Lotusphere last week.

Lotus made two Notes API announcements. To make Notes application development easier for corporate developers, Lotus unveiled Notes HiTest Tools for Visual Basic. This Windows-based tool is essentially a set of Microsoft Corp. Visual Basic custom controls, which are miniprograms that can be used to create larger programs. The controls are Visual Basic renditions of Notes objects, such as a formula edit box and dialog boxes for selecting servers and databases.

HiTest Tools works in conjunction with the HiTest Basic API, allowing Visual Basic to create Notes applications. It also allows users of Microsoft Office applications to access the Notes object store through Visual Basic for Applications.

HiTest Tools, which includes the API, will ship in the first quarter of this year and sell for $610.

Lotus also announced a new version of the Notes HiTest C API, which will be incorporated into the Lotus Toolkit Collection CD immediately. The company also plans to announce a Notes HiTest C++ API, to ship by the end of the year, and is expected to announce Notes APIs that support Oracle Corp. and Powersoft Corp. development tools.

Lotus also announced that the NotesView server management product it has already publicly discussed will ship this quarter, with prices starting at $3,500.

NotesView, based on Hewlett-Packard Co.'s OpenView, allows administrators to monitor Notes server operations in real time. The product, which can run on a remote workstation, tracks mail routing, replication activity, and server and network status. The system runs on Windows clients and uses Simple Network Management Protocol.

Later this year, Lotus will ship an API that lets developers extend Notes management applications to be managed by NotesView.

"There are three things to look for in a PC. Price, price and price."

(But we're presuming you wouldn't reject value, value and value.)

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Conferencing partnership aims for interoperability

■ WorldWorx Solutions will ensure compatibility among voice, video, data products

By Bob Wallace
(WASHINGTON) AT&T announced 11 new members of the WorldWorx Solutions industry partner program at the ComNet '95 conference here last week.

WorldWorx Solutions is a family of products and network services that support simultaneous and real-time interactive voice, video, and data communications.

The new backers include Novell's WordPerfect group, Sybase Inc., Compression Laboratories Inc., DataBeam Corp., Vivo Software Inc., and Insoft Inc., and bring the number of WorldWorx partner vendors to 22.

"The issue for users here is desktop-to-desktop interoperability for conferencing," said Mark Langner of TeleChoice Inc., a Verona, N.J., consultancy. "There are standards and there are proprietary schemes."

AT&T and its WorldWorx partners have offerings that comply with the H.320 protocol for videoconferencing systems, established by the International Telegraph and Telephone Consultative Committee (known by its French acronym, CCITT). Bridging equipment in AT&T's long-distance network can convert proprietary protocols to H.320.

▸ AT&T's WorldWorx Services videoconferencing service will offer multipoint-to-multipoint communication by the second quarter.

This function, which can also be performed by special equipment in users' private networks, is important because many users have already bought Intel Corp.'s ProShare PC package, which uses Indeo, a proprietary protocol, Langner said.

Software vendors will need to build WorldWorx APIs into their applications to work with the WorldWorx service. Novell plans to do this in its PerfectOffice and GroupWise applications.

"WorldWorx is achieving critical mass in the market as far as partners are concerned, which means users don't have to buy videoconferencing systems from the same vendor to ensure they'll work together," Langner said.

The first 11 vendors to pledge support for WorldWorx included Apple Computer Inc., Hewlett-Packard Co., IBM, Intel, Lotus Development Corp., Sun Microsystems Inc., PictureTel Corp., and VideoServer Inc.

Ernie DeNigris, an AT&T vice president, said that with AT&T's WorldWorx Personal Conferencing Service, companies can use any of the compatible hardware and software from WorldWorx partners and be assured they will work together.

AT&T will coordinate the ordering and installation of the required digital access or ISDN Basic Rate Interface service from each site to the AT&T long-distance network.

INTERNET APPS WILL TAKE CENTER STAGE AT DEMO 95

By Ilan Greenberg and Karen Rodriguez
A SLEW OF NEW Internet software packages from Novell Inc., Quarterdeck Office Systems Inc., and other companies will be showcased at Demo 95 next week.

In a bid to one-up Microsoft Corp.'s recent announcement of Internet Assistant, Novell Inc. will ship in March a free Internet add-on for WordPerfect 6.1 and a CD-ROM-based World Wide Web (WWW) browser and authoring tool.

The add-on to WordPerfect 6.1, code-named Internet Toolkit, will let users publish and view WWW documents. It will also include a WordPerfect Envoy miniviewer to let users view documents with embedded graphics on the Internet.

Microsoft has delayed the release of its own Internet Assistant until the end of February.

The second Novell Internet package, code-named Toolkit+, is a WWW browser and viewer designed to let users edit Internet documents. Toolkit+ will also provide a TCP/IP stack, the ability to author Standard Generalized Markup Language documents, and automatic access to several service providers, according to sources close to the company. Pricing information was not available.

Also at Demo 95, Quarterdeck will announce a Windows-based Web server and its WWW browser called Normandy, unveiled at fall Comdex last year. The Quarterdeck suite, which will ship early this year priced at less than $5,000, includes tools for creating Hypertext Markup Language documents.

Bigger displays on the way

Compaq slates big changes to gain edge in notebooks

By Bob Francis and Yvonne L. Lee
SEEKING TO REGAIN lost ground in the portable market, Compaq Computer Corp. plans both product and management changes for its portable PC division, sources said.

Compaq plans additions to its Contura notebook line and will shortly offer a 50-MHz 486DX2 processor-based system, sources said.

The company will also make changes to its high-end LTE Elite line. By the end of March, Compaq will add a system with a 10.4-inch active matrix color screen and will offer as an option a lithium ion battery with longer life, sources said.

Competitors have beaten Compaq to the market in both these areas. IBM and Toshiba America Information Systems Inc. have long had 10.4-inch screens for their portables, and Dell Computer Corp. added lithium ion batteries to its notebooks last year.

One way that Compaq plans to get new technology to market faster is by working with other notebook manufacturers, according to sources.

"It's amazing they haven't realized that's really the secret in this market," said an executive at a rival PC vendor, who asked not to be identified.

Sources said Compaq will license a Pentium-powered notebook with a built-in CD-ROM drive from Inventec Electronics Co. of Taiwan.

Inventec also manufactures Apple Computer Inc.'s Newton MessagePad 110.

The Houston-based PC manufacturer is also mounting a wide-ranging search for new talent for its portable group, the company confirmed. Sources also say Compaq has hired Jeff Greenberg, a product manager from portable rival Toshiba America Information Systems Inc., as a product manager for Compaq's Contura line of notebooks.

Compaq dropped from No. 1 to No. 2 in the portable market last year, with product delays and recalls contributing to its decline.

The IS manager who runs Compaq's portables said the company's new products looked good but were quickly bested by the competition last year.

Toshiba overtook Compaq as the top portable vendor last year, according to International Data Corp. (IDC), a Framingham, Mass., research firm.

Irvine, Calif.-based Toshiba shot up from 12.2 percent of the market in 1993 to 15.6 percent last year, according to IDC. Compaq's market share went from 13.1 percent to 14 percent.

Compaq ready to update portable lines

For completion by the end of the first quarter

- Refurbish LTE Elite with 10.4-inch active matrix color screens and lithium ion batteries.
- Announce new 50-MHz 486DX2-powered Contura.

For completion by the second half of this year

- Announce a Pentium notebook with built-in CD-ROM.
- Announce an update to the Contura Aero subnotebook.

OpenDoc

Continued from page 1

compatibility was also limiting Mac applications.

"Developers want the same features across OS platforms. This should help us get developer support for features like QuickDraw GX," Nagel added.

Although Apple said it was committed to using OpenDoc to deliver OS enhancements to the Windows and Macintosh platforms, a company spokeswoman said that Apple hadn't made a decision on which specific technologies it would support.

However, ISVs said they have already seen demonstrations of QuickDraw GX and PowerTalk — Apple's E-mail architecture — working as OpenDoc components.

Other technologies that could end up on Windows via OpenDoc include QuickTime; three-dimensional graphics; Apple's AV technology, which includes text to speech, voice recognition, and video support; the GeoPort programmable communications technology; intelligent help; updates to technologies such as AppleScript; speech to text; and customizable user interfaces, sources said.

Not all of these technologies would be included with OpenDoc, and some may only be available on the Mac, sources said.

"It simplifies the development effort greatly," said Brian Arnold, director of software development at Lumina Decision Systems Inc. "There are aspects of QuickDraw, like faster printing, that I will get for free. I won't have to do any additional work."

"Apple's been doing a good job of putting its plans into place for cross-platform performance," said Richard Doherty, founder of Envisioneering Inc., a market research firm based in Seaford, N.Y.

"And they've done a good job of letting the Adobes and the Lotuses know about this, but they have to get the word out to users and other developers," Doherty added.

Although Apple wouldn't reveal how it intends to meld OpenDoc with its OS enhancements, sources indicated that the company is considering bundling core technologies with OpenDoc developer kits for ISVs.

Those ISVs could bundle technologies such as QuickDraw GX — or portions of those technologies — with their own applications. Other OpenDoc-enabled applications would then be able to have access to those technologies.

Apple would not provide availability dates, although software developers familiar with Apple's plans said they expected the first implementation of this technology to ship soon after OpenDoc 1.0 is released later this year.

Tom Quinlan contributed to this story.

For the record

Due to an editing error, the Jan. 16 story "Microsoft's logo policy eases up on OpenDoc" (page 1) incorrectly paraphrased a statement attributed to Jed Harris, president of CI Labs. The story should have quoted Harris as saying that developers can obtain OLE-OpenDoc interoperability by writing to the OpenDoc API.

"PCs have all the same feeds and speeds. They're a commodity."

(Alert product development, we must be going about this all wrong.)

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NetWare Directory Services

NLM releases to support NDS

By Paul Krill

NOVELL INC. WILL RELEASE this spring a range of NetWare Loadable Modules (NLMs) supporting NetWare Directory Services (NDS) to provide connectivity from NetWare to mainframe and Unix environments.

The new NLM gateways that will incorporate NDS support include NetWare for SAA (Systems Application Architecture), NetWare NFS, NetWare/IP, and NetWare Connect. NetWare for SAA supports links between NetWare networks and IBM SAA mainframe-based networks, while the NetWare NFS NLM includes three products providing connectivity with Unix systems.

NetWare/IP supports TCP/IP; NetWare Connect provides dial-up access to NetWare.

Also due is an NLM supporting NDS in the Novell GroupWise E-mail and scheduling package. (See "Novell to detail MHS migration strategy," Nov. 28, 1994, page 6.)

"The bottom line of the [NLMs] being integrated into the directory is now I have seamless access, saving resources and saving administrative time," said Jim Greene, Novell product line manager for NetWare server products.

NDS provides a single naming entry to network resources, instead of setting up entries on each server in the enterprise.

Users still need authorization to access systems on the network.

Prices for the new NLMs have not been announced. The first NLM will ship next month. NetWare NFS and NetWare/IP will miss their scheduled ship dates by about 30 days because of delays in development, Greene said.

NDS support should improve the credibility of NLMs, which have been criticized as being an inferior alternative to using a general-purpose operating system as an application platform. NLMs have also been criticized in the past as being complex to develop and too proprietary.

"It's a closed environment," said integrator Bob Marsh, district manager for Valinor, in Atlanta, which is selling both Windows NT and NetWare but is emphasizing Microsoft products. "You're painting yourself into a corner. [NLMs] run only on NetWare servers, and the environment changed when going from NetWare 3.x to 4.x," said Marsh, referring to the new directory services and revised messaging APIs.

NLMs, however, do have supporters, such as a systems integrator in Houston who is pleased with the performance of the NLM for Lotus Notes.

"We've tested its response time and how it acts, and it acts just fine," said L.J. Skibbe, vice president of technical services at Vision Integration Services Inc.

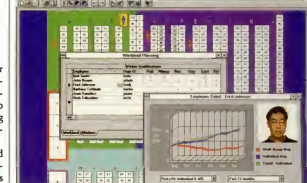
The new NLMs follow the December certification of 47 third-party NLMs supporting NetWare 4.1, although not all of these take advantage of the directory services.

Novell's new NetWare Loadable Modules

They support NetWare Directory Services and are scheduled to ship between February and May.

- NetWare for SAA provides NetWare-IBM connectivity.
- NetWare NFS provides NetWare-Unix connectivity.
- NetWare/IP gives NetWare access to TCP/IP.
- NetWare Connect supports asynchronous access to NetWare networks.
- Novell's GroupWise is an E-mail and scheduling package.

SOURCE: NOVELL INC.



PART OF FOURGEN'S INVENTORY *control module is a Warehouse Manager. It offers users a graphical view of purchasing requirements.*

FourGen's Enterprise speeds up order entry

By Ilan Greenberg

AIMING TO SPEED UP order entry and inventory tracking, FourGen Software Inc. this week delivered Release 4.1 of its Enterprise series of supply-chain and financial management software.

The series includes applications for inventory control, replenishment, order entry, and purchasing, as well as several accounting modules, such as general ledger, accounts receivable, accounts payable, fixed assets, and payroll.

"A number of people have finally figured out it's not just the goods but the finances that have to be managed at the same time, and FourGen is pretty close to first to market with that kind of credible solution for supply-chain software," said Ed Black, an analyst with Boston-based Aberdeen Group Inc.

FourGen said that in response to customer requests it has added several key capabilities to the package. These include reduced ordering time, credit management displays at the individual customer level, and customized codes for damaged, returned, or repaired items for more efficient use of warehouse space.

Enterprise 4.1 prices start at $45,000 and depend on the number of users and platforms supported. Enterprise 4.1 runs on Unix servers with Windows 3.x clients.

Some users now implementing Enterprise 4.1 praised the system's capability to accommodate offices of varying sizes and its multicurrency functionality; they singled out the replenishment module, which recommends inventory and purchasing levels, as impressive.

"First of all, it handles multicurrency, important for our worldwide operations," said Steve Crouch, system implementation coordinator at Daewoo Equipment Corp., a manufacturing conglomerate, in Warrensville Heights, Ohio. "And it's very flexible, allowing us to modify and automate areas as we go along. Also, the replenishment module gives us the ability to calculate [warehouse] usage out into the future."

Sun, HP to unveil multiprocessing workstations

By Yvonne L. Lee

COMPETITION IN THE multiprocessing workstation market will heat up this quarter when Sun Microsystems Inc. upgrades its Sparcstation 20 line and competitor Hewlett-Packard Co. brings out its first multiprocessing workstation.

Sun this week will introduce the Model 71 single-processor system and the Model 712MP with dual processors, both using its 75-MHz SuperSparc-II chip. Pricing starts at $17,900. Workstations using the 90-MHz SuperSparc-II chip will ship later this quarter.

The new Sparcstation 20 model will perform 20 percent faster than the Sparcstation 20 Model 60, the sources said. Its 75-MHz processor has an integer rating of 115 SPECint92 and a floating-point rating of 135 SPECfp92.

This is the second upgrade to the Sparcstation line. In November, Sun introduced the Sparcstation 20 Model HS11, which uses Ross Technology Inc.'s 100-MHz HyperSparc processor and performs 12 percent faster than the Sparcstation 20 Model 60, which has a 60-MHz SuperSparc processor.

Sun is expected to discontinue the 50-MHz SuperSparc-based Sparcstation 20 Model 50 workstation when the new computers ship.

Chief rival HP will bring out in March an HP 9000 Series 700 workstation that can support one or two 125-MHz PA-7200 processors, sources said. That processor has an estimated integer rating of slightly less than 140 SPECint92 and floating-point performance of slightly less than 185 SPECfp92.

The single-processing system will perform only slightly better than the Model 735 workstation with a 125-MHz PA-7150 processor.

Most of HP's multiprocessing efforts will still focus on servers, analysts said. Very few workstation applications have been rewritten to take advantage of multiprocessing, said Andrew Allison, editor of *Inside the New Computer Industry*. Most desktop applications show only a 25 percent performance gain with an additional processor.

IBM finds home for Workplace with electronics companies

By Jason Pontin

EVEN AS IBM CONTINUES to promote its Workplace microkernel as a PC operating system, the company is reaching out to electronics manufacturers to provide an outlet for the 2-year-old technology.

"IBM's microkernel is all but dead," said Rob Enderle, an analyst at Dataquest Inc., in San Jose, Calif., who worked at IBM in the OS/2 group until about six months ago.

"They haven't been able to generate any revenues for it, but it has an extremely high cost-stream," Enderle said. "So if they can't make it pay as a PC operating system, they'll license it as something else."

The microkernel is an AIX derivative that provides basic instructions for a number of microprocessors. IBM announced last week a cross-licensing agreement with Komatsu Ltd. of Japan to use the IBM microkernel as a factory automation platform.

Komatsu's electronics division is a prominent Asian producer of factory automation systems; the company will build automation programs and other real-time control systems atop the microkernel to run on PowerPC-based and other RISC-based workstations.

Other analysts cautioned that this agreement should not be viewed as an act of desperation, but instead as a long-anticipated evolution of the microkernel.

"Is IBM revenue conscious at the moment? Sure," said Andrew Allison, editor of *Inside the New Computer Industry*, in Carmel, Calif. "But there are advantages to the microkernel that make it very attractive for real-time applications."

The Komatsu agreement is IBM's third deal. In November 1994, IBM licensed the microkernel to Goldstar, the Korean electronics giant, for use in multimedia and consumer products. In October 1994, IBM and Digital Equipment Corp. said they would work together to create real-time and embedded applications for the microkernel.

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- ❑ Every newsweekly should have one.
- ❑ It's bold. It's flashy. It's Stewart.

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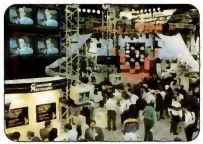

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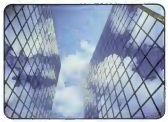

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Vendors rally to secure Internet

■ Encryption-based systems readied

By Karen Rodriguez

INFORMATION SYSTEMS managers are being advised to take tougher precautions against network attacks from Internet intruders and to demand better security in firewall products. (See related story, page 84.)

Sun Microsystems Inc., IBM, Digital Equipment Corp., and Trusted Information Systems Inc. (TIS), which currently offer firewall products to control incoming and outgoing Internet traffic, are developing encryption-based security systems to protect networks.

"There are two major sources of security problems on the Internet: One has to do with authentication; the other has to do with bugs in software running on Internet machines [and the configuration of those machines]," said Steve Bellovin, a computer security researcher at AT&T Bell Labs. "The only real long-term answer is cryptographic authentication, which customers need in products, because address-based authentication will not prevent attacks."

There are prototypes now that support network-level authentication and encryption to make data secure so users know to what host they are talking, Bellovin said.

Sun and IBM have both made proposals for Internet Protocol (IP)-level encryption to the Internet Engineering Task Force (IETF) security working group. They are building enhancements to their firewall products that include encryption technologies.

"Now the Internet is flourishing on a party-line basis, and the next step is to require digital signature and encryption. That's what it takes to do electronic commerce," said Eric Schmidt, chief technical officer of Sun.

IBM began shipping this month NetSP Secured Network Gateway, a software proxy server program that requires authentication for user access to applications.

"Our fire wall is more than password-level authentication. We use authentication in smart cards from Security Dynamics Inc.," said Vijay Ahujan, network security product manager for IBM.

IBM plans to offer support for encryption in its firewall technology and at the network layer level.

Currently there are two major specifications in the works within the IETF, according to Steve Crocker, chairman of the IETF security working group.

"One is for the addition of authentication and encryption to the IP. The other is digital signatures in the Domain Name Server [DNS]," Crocker said.

Digital plans to respond to customers' requests for better data encryption security on hosts that serve as fire walls. The company is refining the filtering rules in its Internet proxy server to provide better protection against unauthorized access, said Bill Pozercki, Internet security services manager at Digital.

"Commercial customers are getting on the Internet — they need encryption and IP tunneling," Pozercki said.

TIS will offer firewall-to-firewall and host-to-host encryption in the next version of its Gauntlet firewall server, which is expected to ship within months, according to Fred Avolio, Gauntlet product manager at TIS.

Hughes Aircraft Co., in Los Angeles, wants to establish its NetLock IP encryption product as a standard by licensing it to network vendors for implementation in TCP/IP stacks. The company built its own security software after it was unable to find an efficient solution on the market, said John Garber, general manager for network security products at Hughes.

"Security is critical to Hughes. We are a large company and have networks that span the world, and it's so easy these days with snooping software to watch data packets from any station," Garber said.

Microsoft ally

Dell, Microsoft sign marketing agreement for Windows 95

By Bob Francis

DELL COMPUTER CORP. has signed on with Microsoft Corp. to market the software giant's Windows 95 operating system when it becomes available.

Austin, Texas-based Dell will offer the 32-bit operating system on its desktop and notebook product lines, company officials said.

Some companies have balked at Microsoft's terms; several vendors decided to put off any decision when Microsoft announced it was delaying the operating system until the third quarter.

Dell's decision to preload the as-yet-unavailable operating system is probably related to Dell's desire to gain a higher profile among corporate users, analysts said.

Microsoft has been driving a hard bargain with hardware companies on the royalty rate for Windows 95; it offered discounts to companies that signed on early with the operating system.

Dell officials declined to disclose or specify any contractual terms between the two companies.

According to several hardware vendors, Microsoft was offering a royalty rate of $55 for Windows 95 but offered to cut the price nearly $10 if the vendor began supporting the operating system immediately.

Microsoft wanted hardware companies to announce support early to deflect attention from IBM's recent introduction of OS/2 Warp.

"It's kind of become a nonissue at the moment, with the delay," said one product manager at a hardware company.

Dell will preload either the Windows operating system or OS/2 Warp on its PCs and notebooks, depending on the user's preference.

Dell will likely be included in Microsoft marketing materials that will focus on corporate customers, a market segment Dell hopes to make inroads with this year, analysts said.

Gateway, DFI ship 100-MHz, Pentium multimedia systems

By Nancy Dillon

GATEWAY 2000 INC. and DFI Inc. introduced 100-MHz Pentium-based systems that are shipping now with prices in the $3,000 range.

The P5100, from Gateway, is based on Intel Corp.'s 100-MHz Pentium and lists for $2,999.

The basic system comes equipped with a 1-gigabyte (GB) hard drive, a 15-inch monitor, 16MB of RAM, and the PCI bus architecture.

The system is preloaded with Windows for Workgroups 3.11, Microsoft Office Professional 4.3, and MS-DOS 6.22. The system will also come with Microsoft Corp.'s Bookshelf and Money applications.

The P5100 also includes a quadruple-speed CD-ROM drive and a PCI-based graphics accelerator; other multimedia features must be obtained through upgrades.

When equipped with a 16-bit stereo sound card and speakers, the total system costs $3,158.

DFI's 100-MHz Pentium-based Diamond P100 system comes with a 1GB hard drive, a 17-inch monitor, 16MB of RAM, and the PCI bus.

Both the graphics accelerator and the hard drive controller are connected via the PCI bus, the company said.

The graphics accelerator supports resolutions of 800 by 600 with 16 million colors at 75 MHz; or 1,280 by 1,024 with 256 colors at 75 MHz.

The system also includes eight expansion slots and retails for $3,399.

Its multimedia features include a 16-bit stereo sound card, stereo speakers, and a quadruple-speed CD-ROM drive.

Bay Networks refines multimedia over LANs

By Bob Wallace

(WASHINGTON) BAY NETWORKS Inc. has detailed plans last week at ComNet '95 to ship new router software to enable users to reserve bandwidth for multimedia application support over standard Internet Protocol (IP) networks.

Bay Networks' Version 8.1 router software will support IP Multicasting, which allows simultaneous delivery of data packets to multiple sites. Version 9.0 will let network managers set aside network bandwidth for these sites for use by multimedia applications.

"What Bay Networks is doing is providing users with the means to support multimedia applications over IP networks without having to make any hardware changes to routers or move to [Asynchronous Transfer Mode]," said Bill Horst, a network manager with the General Services Administration, in Philadelphia.

Versions 8.1 and 9.0 will ship in the spring and summer as free upgrades to current Bay Networks router users, said Kathleen Ann Huber, senior product manager for Bay Networks' IP unit.

Version 8.1 will support IP multicast routing with Bay's Distance Vector Multicast Routing Protocol (DVMRP). DVMRP lays the foundation to support interactive applications, such as videoconferencing, between multiple sites.

Version 9.0 will extend multicasting support by offering Protocol-Independent Multicast (PIM). Version 9.0 software will also support an experimental streaming protocol, called ST-II, which combines multicast, resource reservation, and network availability features.

"ST-11 combines these capabilities with reliable transport for sending delay-sensitive traffic like video," said Mick Scully, Bay Networks' vice president of product management. The first iteration of PIM is designed primarily for applications shared by closely distributed LAN sites.

Vendors will have to write to ST-11 APIs in order for their multimedia applications to use Bay Networks' quality of service and bandwidth reservation capabilities, Scully said. The company will make the ST-II APIs available to all interested parties.

Bay will later support PIM Sparse Mode, which is tailored for IP WANs, and Resource Reservation Protocol, which together provide multicasting and resource reservation features. Both protocols are under development by the Internet Engineering Task Force, Scully said.

Network managers who want to set quality-of-service parameters for applications will need to install client software from Syzygy Communications Inc., in Scotts Valley, Calif. Syzygy's Network Quality of Service Solutions software lets users mix multimedia applications with current network traffic.

The Syzygy software adds to the network protocols used by PCs to provide the appropriate controls and services that multimedia applications require to run well over networks.

Network managers set service and bandwidth reservation features when they set up applications for a network, Scully said.

Bay Networks' plan to support multimedia over existing LANs

Phase 1: Bay will support Internet Protocol multicasting across its entire router line. It will also support Internet Group Management Protocol, which will be used to determine the number of destination sites for traffic.

Phase 2: Bay will support Protocol Independent Multicast (PIM), which will be used to support multicast routing between LAN sites. It will also deliver ST-II, an Internet streaming protocol, to combine multicast, resource reservation, and quality of network service capabilities.

Phase 3: Bay will support PIM Sparse Mode for dispersed LANs, as well as Resource Reservation Protocol, which reserves resources through a network path.

SOURCE: BAY NETWORKS INC.

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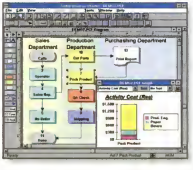

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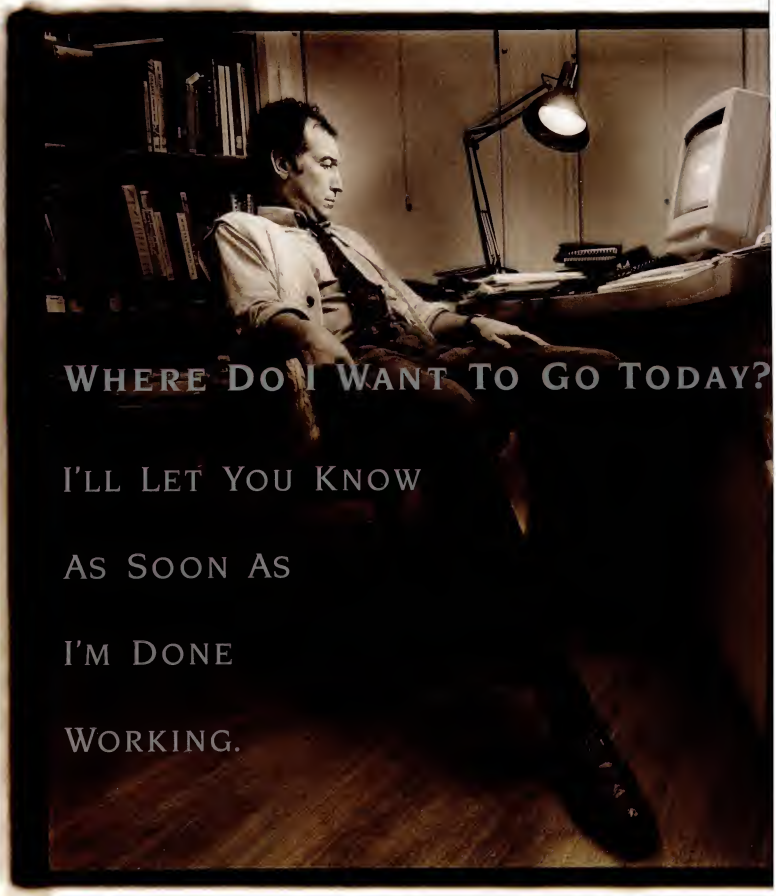

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Sybase

Continued from page 1

by failing to include the service contract price as part of Workgroup SQL Server's base price.

"Sybase is a high-end database, and the real price should include the $4,000 or whatever for support," said Ben Slade, a Sybase user and member of the Washington D.C. Area Sybase Users Group.

Slade, along with a group of fellow Sybase users, is now drafting a letter to Sybase president Mark Hoffman to complain about the policy and demand that it be changed.

But the letter won't come as a surprise to Sybase officials. Although they said that no formal complaints about the policy have been registered yet, the company is already planning to restructure its support policy.

"I'm not surprised it's an issue," said Tim Artl, director of marketing for worldwide customer service and support at Sybase. "Sybase is planning to move to some sort of a la carte system for providing service sometime this year."

But that doesn't calm users who are shelling out for the service contract now.

"For a single-user version [of Workgroup SQL Server], you pay $1,000 for the software and $4,000 for [one year of] support. That just doesn't make sense," said Steve Mushero, president of Globaltech, a Seattle-based client/server consulting firm and Sybase customer.

"Oracle has a lower entry point for support, and that makes sense. You can't sell a Windows database with $4,000 worth of support," Mushero added.

Microsoft offers support plans for its SQL Server database ranging from $7,500 to $20,000 per year, but also offers basic telephone support at $150 per incident.

Oracle charges anywhere from $1,000 to $75,000 per year for a service contract for its Workgroup Server database, but offers $250-per-incident phone support as well.

To rack up $4,000 worth of telephone support under Microsoft's current rate would take 26 separate incidents, or 16 at Oracle's per-incident rate.

The service policy is particularly galling for independent consultants developing Sybase applications for their customers.

Mark Parsons, of Iron Horse Inc., in Reston, Va., said he and many other consultants still have to pay high service fees to the company, even though they do not require constant support.

"When we call tech support, we have a bug to be fixed or we need to know when the next release is coming," Parsons said. "We don't need to have our hand held. I can see why Sybase charges a lot to do that for new users, but we don't need that."

Parsons said some consultants are even switching to Microsoft SQL Server as a back-end database for applications, just based on cost, "even though Sybase SQL Server is better for big sites."

The policy surprised some Sybase watchers, who pointed out that Sybase has enjoyed a reputation among customers as honest and straightforward.

"[Sybase] has been very upfront in the past. But this sounds like bait and switch," said Rich Finkelstein, president of Performance Computing Inc., in Chicago. "They lure you up front with low prices and then hit you with this hidden charge."

Although Sybase's policy may be an egregious example, other analysts cautioned that the Emeryville, Calif.-based company is not alone in trying to fatten profit margins for low-end workgroup databases through hidden charges, such as expensive service contracts and other means.

"The database market is becoming 'commoditized.' So where do you make your money?" said Don DePalma, an analyst with Forrester Research Inc., in Cambridge, Mass. "The answer is in service, consulting, middleware, and integration. They have to make up the difference somewhere."

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Sybase's Workgroup SQL Server	$9,595	$4,000	$13,595
$4,000 or 30 percent of purchase price annually, whichever is higher, for unlimited phone support and maintenance releases.			
Oracle's Oracle7 Workgroup Server	$9,536	$4,960[1]	$14,496
Phone support per incident: $250; unlimited phone annually: $30 per named user, $60 per concurrent user; Bronze, Silver, or Gold plans with minimum 24-hour, seven-day-a-week phone support and maintenance releases: $1,000 to $75,000 per year.			
Microsoft's SQL Server	$5,187	$8,278[2]	$13,465
Phone support per incident: $150; unlimited phone annually: $7,500. Unlimited phone annually with designated account manager: $20,000. Annual maintenance fee for automatic updates: 15 percent of purchase price.			

1 Bronze support group pin.
2. Includes unlimited phone support and annual $778 maintenance charge.

VLIW

Continued from page 1

said sources familiar with this development.

"It's the next generation of Windows. But that's all we're prepared to say for the moment," said Bill Kozewski, Windows 95 project manager. Sources said it is scheduled to ship after Cairo.

Although no Memphis-specific code has yet been written, sources said, it will be designed to work in a 64-bit environment.

The Intel-HP processor, which some sources expect will come out at the same time as Intel's P7, is expected to have a core based primarily on HP's PA-RISC technology and perform as many as 1 billion instructions per second.

It is expected to run HP's Unix OS and have hardware support for running x86 instructions, industry sources said.

"It will run x86 and HP-UX but also offer a crossover OS: Memphis," a source said.

Intel and HP have not decided when they will release the VLIW processor because there is internal debate about whether it should be the primary version of the P7, which is scheduled to ship in 1997, a derivative of the P7, or become Intel's P8 processor, sources said.

Advanced Micro Devices Inc. is also working on incorporating VLIW into its K series of processors, sources said, which would also work with Memphis.

VLIW gains processing efficiency by putting the burden of instruction scheduling on the compilers. It can also combine a series of instructions that can be processed simultaneously.

"[Memphis] would take some instructions and gang them together for the PA-RISC core," said a source referring to VLIW optimizations being considered for Memphis.

Microsoft will "optimize Windows NT for VLIW designs," according to Collins Hemingway, Microsoft's business systems division's director of industry marketing.

Memphis will also work on x86, PowerPC, and perhaps other platforms, sources said.

Tom Quinlan contributed to this story.

Intel

Continued from page 1

The first P6 will feature a 133-MHz clock speed and a second-level cache, sources said.

The P55C, scheduled to appear in the second half of this year, will have a 2.5-volt core, the lowest power consumption of any mainstream Intel processor to date, sources said.

It will also support a 3.3-volt I/O interface that is compatible with current Pentiums, operate at 133 and 150 MHz, and come with a 32KB cache, these sources added. That chip would require a new socket capable of supporting the dual voltages, sources said.

Current Pentiums peak at 100-MHz clock speeds and have a 16KB cache.

The recently announced Pentium OverDrive has a 32KB cache but is not a full-fledged Pentium design.

Other P55C processors operating at different clock speeds will also emerge.

Intel has also discussed a P55CT processor, which would have a P6 processor core and feature some of the same functionality but would fit into the same socket as a P55C, sources said.

The release date for the P55CT processor, which may appear as an upgrade chip, is tentatively set for early 1997.

A 3.3-volt 120-MHz Pentium, code-named the P54CS, is currently being tested by a number of large PC and motherboard manufacturers, according to sources.

Production-level volumes of the processor are expected late in the second quarter.

The chip will be a smaller version of the current P54C and will interface with the system at 60 MHz.

But even with the release of this faster 120-MHz Pentium, server vendors may still opt for the 100-MHz Pentium because of its faster interface, an industry source said.

The 100-MHz Pentium interfaces at 66 MHz and runs the PCI bus at its full speed of 33 MHz; the 120-MHz chip communicates with the system at 60 MHz and usually runs the PCI bus at a slower 30 MHz.

"If you go to the 120 MHz, you may take a 10 percent performance hit. This is not for I/O-intensive servers," the source added.

In 1996, Intel is planning to release a P54CT processor, which would work with current Pentium system designs but have a 2.5-volt P55C core. This would operate at clock speeds as high as 180 MHz.

Gupta

Continued from page 1

No final price had been set at deadline, but Ranger will be priced at less than $500, according to company president and CEO Umang Gupta. A run-time version of SQLBase, priced at $99, will also be available for application developers building and deploying SQLBase applications.

Both the enterprise and Ranger versions of SQLBase will include big-system features, such as stored procedures and triggers, and support for Gupta's SQLWindows Application Language.

All three versions are due to ship within 60 days of the announcement early next month.

The three versions debut to accolades from some users.

"We chose SQLBase because it could be embedded, had high-end database capabilities, and had great capacity for report generation," said Dudley Land, vice president of customer automation at United Parcel Service (UPS), in Atlanta. UPS is planning to use the Ranger version of SQLBase to build a system for tracking packages, preparing billing information, and producing reports for management.

Nevertheless, Gupta sees its future in the development tools market, not databases. The company plans to de-emphasize its database business and reinvest itself as an application development and deployment company.

"SQLBase will take a subordinate role to our application development environment," Gupta said.

The next step for Gupta is to migrate its tools to an object-based development environment, code-named Centura. Although the strategy is still in the planning phase, the company plans to debut Centura components slowly during late 1995 and early 1996, according to Phil Ressler, vice president of corporate marketing at Gupta. He added that Centura will be a full 32-bit system for Windows 95.

"Centura is more of an idea of how our tools and databases will be wedded together," Ressler said. "The idea is to build a 'componentized' software system that's open and connectable to a very rich array of data, beyond a SQL-centric world."

He added that Centura will include an object repository and an array of tools that will allow users to "deal with video, graphical, and SQL data on an equal footing, and to deploy objects and software components."

Ressler said SQLWindows will be part of Centura but that SQLBase's role is undetermined. "We don't know if SQLBase will be the repository at this point," he said.

After fierce price competition with its arch rival Powersoft Corp., culminating in the acquisition of Powersoft by Sybase Inc., Gupta needs a jump-start. The company last week reported a $24 million loss for fiscal year 1994.

Jai Singh contributed to this story.

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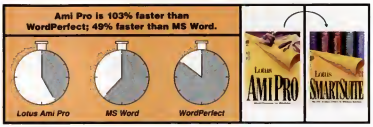

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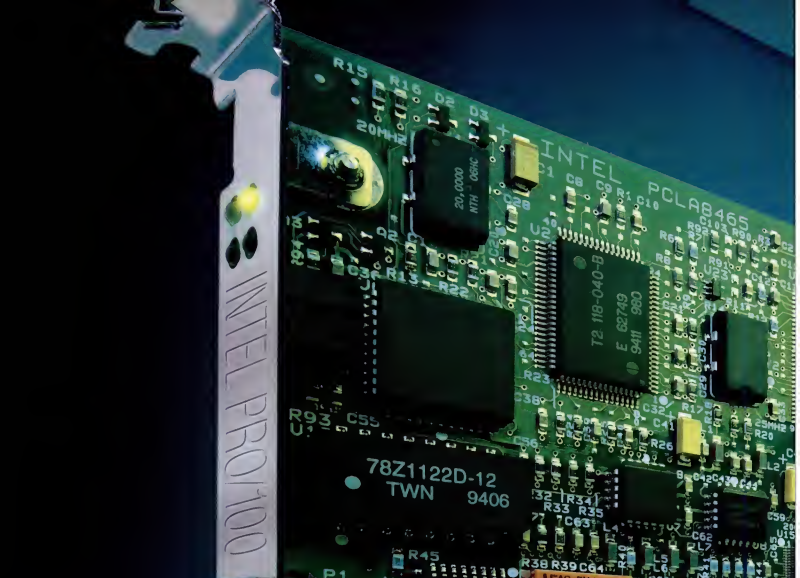

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PIPELINE

PRICE CUTS

Corel Corp. has announced price cuts for several of its flagship products. Effective Feb. 1, CorelDraw 3 will drop in price on floppy disk from $199 to $149 and on CD-ROM from $149 to $99. CorelDraw 4 will drop from $595 to $249 on floppy and from $395 to $199 on CD. Ventura 4.2 will drop from $249 to $149 on floppy and from $199 to $99 on CD. The CD prices for Corel Photo-Paint 4 and Corel Ventura 5 will drop from $199 to $99; prices for these two products on floppy disk will remain at $249. (800) 836-7274.

REPORTED

SYBASE INC. said revenues for its fourth quarter, which ended Dec. 31, 1994, jumped 56 percent to $214 million, while net income reached $29 million, up 60 percent from a year ago. Overall, Sybase's revenues for fiscal year 1994 increased by 63 percent to a record $694 million. Net income climbed by 70 percent to $75 million. Sybase's merger with Powersoft Corp., announced last November, should become final on Feb. 13, pending shareholder approval.

POWERSOFT CORP. reported that revenues for the fourth quarter, which ended Dec. 31, 1994, were up 90 percent to $41 million, compared to revenues of $21 million for the fourth quarter of 1993. Net income for the quarter was more than $4 million, up 116 percent over the same quarter last year. For the year, which also ended Dec. 31, the company's revenues increased to $132.6 million, compared to $57.4 million for fiscal year 1993. Net income increased from $6.5 million in 1993 to $13.8 million.

COMPUTER ASSOCIATES INTERNATIONAL INC. said revenues for its third fiscal quarter, which ended Dec. 31, 1994, were $721 million, an increase of 26 percent over the $574 million reported for the same period last year. Net income was up 40 percent to $174 million, compared to the previous year's net income of $124 million.

SOFTWARE

Windows NT starts to pick up steam

By Jason Pontin

A YEAR AGO the conventional wisdom said that Windows NT was a big disappointment to Microsoft Corp. But at the first Windows NT Server Professional Developers Conference in Seattle earlier this month, independent developers and Microsoft business systems division executives were nearly giddy about NT's apparent turnaround in the second half of 1994.

NEWS ANALYSIS

Industry analysts agree that Microsoft's patience plus a revamped and revved-up upgrade, NT 3.5, have paid off. Windows NT Server 3.5 has begun to establish itself as an alternative to Novell Inc.'s NetWare as an application server and file and print server, and NT Workstation 3.5 is gaining against Unix variants running on workstations. (See "NT makes headway in workstation market," Dec. 26, 1994/Jan. 2, 1995, page 10.)

Microsoft will not disclose its actual 1994 sales figures for NT, but Meta Group Inc., in Stamford, Conn., believes NT Workstation's total installed base is now 406,000 users and there are 141,000 licensed NT Servers. In 1993, the Meta Group reported 188,000 installed bases for standard NT 3.1 and 47,000 for NT Advanced Server 3.1. Microsoft attributes the change in NT's fortunes to substantial improvements in NT 3.5 over NT 3.1. The company believes that NT Advanced Server 3.1, though a good application server, suffered in comparison to NetWare as a file and print server, and that standard NT 3.1 required too much memory to compete against workstations with similar performance.

NT Workstation 3.5, however, requires only 16 MB, and NT Server 3.5 outperforms NetWare 4.0 on file and print tasks with less than 20 clients. (See "Beyond NetWare 3.12," Dec. 19, 1994, page 66.)

"You want to know why we're doing so well?" asks Mike Nash, Windows NT Server group product manager. "It's because a lot of people who wanted workstations can suddenly afford them, and because we made NT Server as good a file server as NetWare, and it remained a much better application server."

Some users agree.

"We're looking to use NT Server because it's really very good as a multitasking database server, though we intend to stay with NetWare for print and file. And [NT Server] has beautiful development tools," says June Babilla, IS manager at Skjerven, Morril, et al, a San Jose, Calif.-based law firm.

But analysts attribute NT's newfound success more to mistakes by Microsoft's competitors than to fundamental change in the NT software.

"I think 'bewildered triumph' is a fair description of the mood in Microsoft's business systems division. NT is taking market share by

▷ WINDOWS NT *page 30*

Database vendors clamp down on data security with encryption

By Mike Ricciuti

RECOGNIZING THAT USERS need secure data transmission across a network to keep sensitive data and passwords private, database software makers are now ramping up to include data encryption features in their core products.

For users who have moved from centralized mainframe and minicomputer systems, in which data was kept under lock and key to distributed systems, data encryption before transmission across a network is essential. But few vendors have offered secure services until now, according to analysts.

"The state of security in the database market today is sort of like where NetWare 2.x was several years ago," said Gary Voth, group product manager in Microsoft Corp.'s Business Systems Group. "Each server has its own set of users, and there is no way to manage passwords or ensure secure transmissions between servers."

Microsoft, Oracle Corp., Informix Software Inc., and Sybase Inc. all hope to improve database security by incorporating data encryption into database servers and/or connectivity software.

Voth said Microsoft SQL Server 9S, now in beta testing and due in the first half of this year, will include encryption of data and user passwords across TCP/IP, IPX/SPX, and most other network protocols. Microsoft, in Redmond, Wash., will also integrate SQL Server's user log-in with Windows NT security services so administrators can centrally manage all passwords across server domains. Pricing for SQL Server 9S has not been announced.

Oracle earlier this month announced Oracle Secure Network Services, an add-on data encryption package for Oracle's SQLNet connectivity software. The software encrypts data sent between Oracle7 databases and can be used with the company's gateways to protect data transmissions from DB2, IMS, Rdb, and other legacy databases. It installs on each client as well as on the server and is priced from $200 per system. Supported platforms include Windows 3.1, OS/2, NetWare, and several versions of Unix.

Database makers tighten security

Company	Product	Availability
Oracle Corp.	SQLNet add-on Secure Network Services	Shipping
Informix Software Inc.	DCE/Net	Shipping
Microsoft Corp.	Data encryption in SQL Server 9S	Set to ship this spring
Sybase Inc.	Data encryption in Replication Server	In beta testing by March

Informix last week shipped DCE/Net, a software layer that connects client applications to Informix, Sybase, Oracle, and other back-end databases. The software, priced at $375 per user, uses the Distributed Computing Environment's Kerberos security service to authenticate passwords and encrypt data.

Sybase is not yet offering data encryption. But Terilyn Palanca, Sybase director of product management for parallel and distributed computing, said Sybase SQL Server users will be able to encrypt passwords through an update to its Replication Server software, due to enter beta testing in March. (See "Sybase to unveil SQL Server link to Notes," Jan. 23, page 6.)

Microsoft is at (206) 882-8080.

Oracle, in Redwood Shores, Calif., is at (415) 506-7000.

Informix, in Menlo Park, Calif., is at (415) 926-6300.

Sybase, in Emeryville, Calif., is at (510) 922-3500.

IMRS adds accounting apps to Hyperion financial analysis line

By Ilan Greenberg

USING ITS HYPERION LINE of financial management, consolidation, and reporting modules as a jumping-off point, IMRS Inc. is about to plunge into the general business applications market.

As part of a series of modules called Hyperion Financials, IMRS plans to ship general ledger, accounts payable, and system administration modules and customization tools for Windows by the end of the first quarter.

IMRS has traditionally offered sophisticated high-end analysis tools that access a company's existing financial packages for raw data. With the new line of modules, IMRS officials hope corporations will turn to the company for their basic accounting modules as well. This strategy will set them against client/server application leaders SAP AG and Oracle Corp.

Key features in Hyperion Financials include multicurrency support and dynamic on-line processing. The modules also include a newly designed Windows user interface offering drag-and-drop capabilities and customizable screens.

"Our software is geared toward making sense of multinational financial information at very large corporations," said Judith Rothrock, a spokesperson for IMRS.

A second wave of products currently under development include purchasing, accounts receivable, and fixed assets modules. IMRS declined to specify a release date for these modules.

Analysts briefed on Hyperion Financials were impressed.

"I think [Hyperion Financials] is going to be a pretty good offering," said Barry Wilderman, an analyst with Meta Group Inc., in Stamford, Conn. "The company is well poised to put a basic line of financial applications into the marketplace."

IMRS has not announced pricing for Hyperion Financials.

IMRS, in Stamford, Conn., can be reached at (203) 321-3500.

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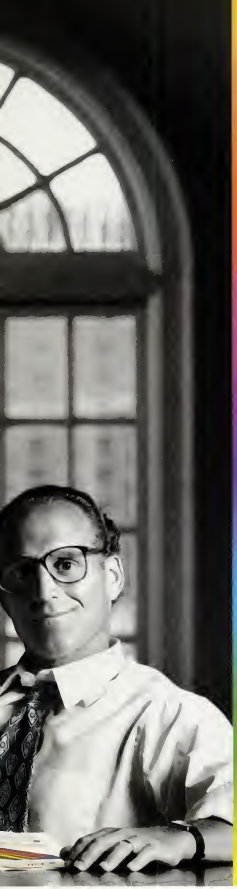

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MediaDB targets multimedia

By Mike Ricciuti

A SANTA CLARA, Calif.-based company claims its brand-new multimedia database management system can store, index, and retrieve multimedia data as easily as relational databases handle tabular data.

MediaWay Inc.'s MediaDB is aimed at companies that want to build what MediaWay calls multimedia cataloging applications that manage images, sound, and video across multiple back-end platforms.

An advertising agency, for example, might want to use MediaDB to build an application that accesses images of last year's ads stored on several servers, said David Yockelson, an analyst with Meta Group Inc., in Stamford, Conn.

MediaDB supports NetWare, Windows NT, Macintosh, and Unix OSes. Client applications run on Windows 3.1 and on the Macintosh.

MediaWay isn't the only vendor to target this niche, however.

Relational database vendors, such as Oracle Corp. and Sybase Inc., also plan to add better support for multimedia data types to their database servers.

In addition, several desktop software companies are promoting client databases for storing scanned images, such as CompassPoint from Northpoint Software.

MEDIAWAY'S *MediaDB provides tools for creating front-end multimedia applications.*

MediaDB is unique in that it provides a development environment for creating client/server applications specifically for managing multimedia data types.

"People have been trying to force multimedia data into a variety of databases. MediaWay is one of the few companies to optimize a database to deliver multimedia data across the network," Yockelson said.

MediaDB includes tools for browsing and playing most video, sound, and image file types. MediaDB costs $10,000 for a development kit including tools and a run-time development copy of the database and $10,000 for a 20-user client deployment license.

MediaWay is at (408) 748-7400.

Gold Disk to present multimedia Astound

By Pardhu Vadlamudi

GOLD DISK INC. is ready to offer users a new way of managing their presentations — one that can be used to create traditional or interactive presentations.

The Santa Clara, Calif.-based company is set to launch Astound 2.0, focusing on introducing authoring tools that allow the user to incorporate multimedia elements such as animation, sound, and video clips into presentations.

Astound 2.0 for Windows, scheduled to ship in February, comes bundled with Astound Studio, a series of editing tools including a Sound, Image, Actor, Video, Animator, and Draw editor.

The company's goal is to offer authoring tools that are easier to use than specialized packages — such as Macromedia Inc.'s Director — but powerful enough to create interactive multimedia presentations such as public information kiosks or training sessions. Still, company marketing officials expect 90 percent of Astound users will continue to use the package for creating basic presentation slides.

Astound 2.0 is the first update to the program since Version 1.5 shipped last February. Some users have complained about bugs in Version 1.5, specifically about problems with video drivers, although some concluded that the software's features were worth some bugs.

"You have to be determined to use this with all the bugs in it," said Robert Piechuta, a system software engineer with Computer Associates International Inc., in Santa Clara, Calif. "I've tried some other products out there, but this is the best of the ones I've seen. I would definitely upgrade to 2.0."

Beta testers of the current version were even more enthused.

"This program is mesmerizing," said beta tester Gordon Miller, director of the Virginia Tech Multimedia Lab, in Blacksburg, Va. "It is one of the more stable products we've seen."

Astound 2.0 is priced at $249, with an upgrade price of $79 for users of Astound 1.5.

Gold Disk is also offering a competitive upgrade price of $99 for users of Microsoft Corp.'s Powerpoint, Lotus Development Corp.'s Freelance Graphics, Software Publishing Corp.'s Harvard Graphics, and Asymetrix Corp.'s Compel.

A native version of Astound for the Power Macintosh will ship by the end of March, the company said.

Gold Disk is at (408) 982-0200.

Windows NT

Continued from page 27

default. It's another case of Microsoft's succeeding because its competitors have shot themselves in the foot. Novell and IBM just haven't explained where they're going," says Jeff Tarter, publisher of the *Softletter* newsletter, in Watertown, Mass.

"We believe that NT is doing better because IBM's OS/2 strategy is so confused. We expect to see the majority of accounts with OS/2 switch to NT," says Dave Cerley, an analyst at the Meta Group.

Even so, NT still has a long way to go to catch up with its long-established competitors.

NetWare alone has an installed base of about 1 million servers, according to Novell.

Still, sales figures and anecdotal evidence indicate that both NT Workstation and NT Server are earning their place in American enterprises.

Microsoft now ships more than 1,200 Win32 applications for both the workstation and the server. A year earlier only 200 applications were available for NT.

Microsoft also no longer uses protective pricing for NT. Currently, a 500-user NT LAN would cost an enterprise some $13,000, compared to $16,000 for a similar NetWare 4.1 LAN.

In January 1994, by contrast, Microsoft charged $1,495 per server for NT Advanced Server, regardless of the number of users, a pricing strategy that former Novell chairman Ray Noorda called "predatory."

Altro Solutions introduces its multimedia BusinessPartner

By Ilan Greenberg

THE GROWING ROSTER of sales automation software gained a new contender this week with the release of Altro Solutions Inc.'s BusinessPartner, which boasts innovative multimedia functionality.

In addition to providing the standard sales automation functions, such as contact management, product databases, and quote generation and forecasting, BusinessPartner offers a wide array of multimedia features.

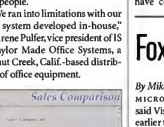
This release of BusinessPartner runs on Macintosh System 7. But the company plans to release a 32-bit version for Windows clients and NetWare or Windows NT servers by the end of this year.

With BusinessPartner, salespeople can store scanned images and recorded sound clips in BusinessPartner's Marketing Encyclopedia for integration of multimedia elements into electronic brochures and presentations.

Another key technology is BusinessPartner's method of data synchronization, called deCoupled Data Synchronization, which allows users to automatically exchange data such as E-mail or price changes between their laptops and the server. Predefined protocols determine which information is distributed to which users, helping to automate the communication process.

BusinessPartner users appreciated the additional visual information that the software makes available to salespeople.

"We ran into limitations with our sales system developed in-house," said Irene Pulfer, vice president of IS at Taylor Made Office Systems, a Walnut Creek, Calif.-based distributor of office equipment.



BUSINESSPARTNER *automatically turns sales data into charts and graphs.*

"With Altro we're excited about giving our sales reps technical and visual information they can use to standardize their presentations. Our reps will now be able to get out from [behind] their desks and to the customers, where they belong," Pulfer said.

BusinessPartner is priced at $1,400 per seat plus $20,000 for the server. Discounts are available for multiple users.

Altro Solutions is located in San Jose, Calif., and can be contacted at (408) 345-4600.

FoxPro and Access get closer

By Mike Ricciuti

MICROSOFT CORP. OFFICIALS said Visual FoxPro 3.0, announced earlier this month, is the company's first step on the road to a common design — and eventually a common database engine — for its FoxPro and Access desktop databases.

Visual FoxPro 3.0 includes several features now common to both databases, such as Upsizing Wizards for moving data to Microsoft's SQL Server database, other Wizards, the Microsoft Query database query tool, and built-in Open Database Connectivity drivers.

Other features, such as team development, will soon be added to FoxPro and will also be introduced in Access, said Dawn Trudeau, general manager of Microsoft's Desktop Databases and Tools division.

"As we add new technology, we will do it once and introduce it in both products," Trudeau said.

Visual FoxPro will gain team programming in a point release later this year, the company said. Sources said they expect Access to gain similar capabilities in an update scheduled for this summer.

▸ See "Visual FoxPro beta impresses developers," Jan.23, page 8.

Users said Microsoft databases and development tools are already beginning to share a common look and feel. "You are really starting to see synergy between Microsoft's products," said Alan Griver, CIO at Flash Creative Management, in River Edge, N.J.

Microsoft has long discussed the development of a common database engine (referred to as the Jet engine) for both FoxPro and Access that will be introduced in stages over the next several years. A common engine, however, will not mean the end of the FoxPro engine, Trudeau said.

"We will still offer both engines to developers," Trudeau said. "Developers will be able to load an engine almost like an installable driver."

Microsoft will allow developers to load and install either the FoxPro engine, to support Xbase and Fox-Pro specific commands, or the common engine, so applications can be developed that run under both Fox-Pro and Access.

WINDOW MANAGER · BRIAN LIVINGSTON

BugNet newsletter clues you in on software quirks

THE SHEER QUANTITY of information zooming across on-line services and the Internet these days makes it tough to stay abreast of everything. Fortunately, someone has taken on the task of scanning the networks for morsels of information you can use to work around various Windows irritations — or at least be aware of why your applications have been acting weird lately.

Bruce Brown is a writer in Sumas, Wash., who produces a 16-page newsletter called *BugNet*. The first issue appeared just last November, but already Brown has nearly 1,000 subscribers for his compendium of esoteric oddities, mostly about Windows software. Topics seem to concentrate on behaviors of Adobe Photoshop, CorelDraw, Delrina WinFax Pro, Intuit Quicken, Lotus 1-2-3, Microsoft (all products), Peachtree Accounting for Windows, and WordPerfect. Perhaps flaws in these products are easier to find because they have such a large user base. In any case, the bugs reported range from the ridiculous to the sublime.

The December issue reports, for example, that 1-2-3, Release 5, won't run more than one auto-executing macro when a group of files is opened. If each file in a group contains an auto-executing macro, only the macro in the last opened file executes. This bug could affect many users, but no work-around seems to be available at this time.

At the other extreme, *BugNet* reports that Word for Windows 6.0a produces an "out of memory" error when a reader runs a macro that calls a subroutine 16,800 times. This is the sort of bug that can easily be cured with DDT (Don't Do That).

Many of the reports in *BugNet*, though they may be useful to only a fraction of users, can come in handy if you're suffering from exactly the problem at hand. For instance, *BugNet* also revealed in its December issue the reason that some users of Windows for Workgroups 3.11 get General Protection Fault crashes when they try to increase the size of their swap file using the 386 Enhanced dialog box of the Control Panel. The secret is to turn off 32-Bit File Access (a protected-mode disk cache) and reboot before trying to change the swap file settings, then re-enable it later.

I revealed in a series of columns last summer some of the problems 32-Bit File Access causes with otherwise legitimate program operations under Windows for Workgroups. (See Windows Manager, July 4, page 25; July 11, page 32; July 25, page 28; and Aug. 1, page 28. For back issue information, see Reader Services, page 100.) But this is the first documented case I've found where 32-Bit File Access interferes with one of Microsoft's own Windows functions.

Twelve issues of *BugNet* cost $25 when sent to a home address or $50 to a corporate address, payable to BugNet, P.O. Box 393, Sumas, WA 98295 (CompuServe: 71630,3644).

Shareware 1, Lawyers 0

The author of the shareware program Uninstall for Windows, Jeff Yablon, won a victory for us all when the U.S. Patent and Trademark Office recently denied MicroHelp Inc. of Marietta, Ga., a trademark for the term "uninstall." I revealed the company's threat of lawsuits in my August 1994 columns. (See Windows Manager, Aug. 15, page 26; Aug. 22, page 26; and Aug. 29, page 31.)

Yablon will celebrate by releasing a completely new version, Uninstall for Windows 2.0, by March 1. The program, which was previously an excellent DOS utility, now is a fully graphical Windows program.

To purchase the program, send $29 postpaid to It's Your Money Inc., 3 Floyd Drive, Mount Arlington, NJ 07856 [(201) 663-4577].

Brian Livingston is the author of Windows 3.1 Secrets *and* More Windows Secrets *and coauthor of* Windows Gizmos *(IDG Books). Send tips to brian_livingston@infoworld.com or fax: (206) 282-1248.*

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PIPELINE

PRICE CUTS

Okidata Corp. announced price reductions on its personal laser printer line of about $100 per system. The OL410e, a 600-dpi, 4-page-per-minute printer, will now have a suggested list price of $739. The same printer with PostScript added will cost $1,039. (609) 235-2600.

SHIPPING

ALPS ELECTRIC INC. is shipping a version of its TrackPoint pointing device for Macintosh computers. The $99 pointing device is similar to the TrackPad in Apple Computer Inc.'s PowerBook 500 series notebooks. Apple licensed and modified the technology from Cirque Corp. for use in its notebooks. Alps has been shipping a pointing device for PCs. (800) 825-2577.

SIGMA DESIGNS INC. has upgraded the software for its RealMagic video boards by adding support for the Video CD 2.0 format and a sound recording utility for the DOS environment. Video CD 2.0, which records and plays back full-length movies on CD-ROM discs, is part of RealMagic 2.2's CD Station, which detects and plays back a variety of CD formats. The software will be included with Sigma's RealMagic MPEG boards and free to registered RealMagic board owners. (800) 845-8086.

OPTIVISION INC. announced the availability of its $2,500 Digital Video Input Board. The board is used to input digital and analog material into a PC. It costs $2,500. OptiVision also cut $2,000 off the price of its OptiVideo digital video filter board; it now costs $7,995. (800) 562-8943.

ANNOUNCED

SIEMENS AG, a $51 billion German technology conglomerate, has agreed to acquire Pyramid Technology Corp. for an estimated $207 million. Pyramid, a manufacturer of high-end servers, will operate as a separate entity within the German company's Siemens Nixdorf informationssysteme AG subsidiary.

MessagePad gains mobile capabilities

■ Apple adds Modem Enabler utility, tools for Newton users and developers

By Yvonne L. Lee

AS PART OF ITS ROLLOUT of the MessagePad 120 this week, Apple Computer Inc. is giving Newton owners and developers tools that will expand the personal digital assistant platform from a super organizer to a mobile data communicator.

The MessagePad 120 includes a lift-off cover, 1MB or 2MB of RAM, a socketed ROM chip for easier system upgrades, and a more accessible PCMCIA slot on the side of the computer. It will ship this week with a list price of $599 or $699, depending on the memory configuration.

The tools will make it easier for developers to create communication scripts for modems, packet radios, spread-spectrum radios, pagers, and network adapters, Apple officials said.

A new Modem Enabler utility will ship with the MessagePad 120 this week and will be available for earlier MessagePads through an operating system revision due to ship in February.

The included Modem Enabler utility will make it possible for users to select a particular modem and configure data transmission rates (as fast as 14.4Kbps), data bits, stop bits, parity level, and handshaking method.

Because Modem Enabler is the only significant enhancement to the OS that Apple will introduce in February, the February OS revision will still be known as 1.3, the company said.

Apple will also provide C++ tools to developers, enabling them to develop their own communication drivers. The tools are scheduled to ship in mid-1995.

With broader support for third-party devices incorporated into the Newton OS, Apple has decided to stop manufacturing its own communications products for the MessagePad line and will no longer be in that business, said Susan Schuman, manager of product planning and strategy for communication products in Apple's Personal Interactive Electronics division.

APPLE'S MESSAGEPAD 120 *and a new communications strategy debut this week.*

The company has already stopped making the serial-port modem for the Newton MessagePad, Schuman added.

Newton owners will be able to download System 1.3 at (800) 639-8669 or request floppy disks with the upgrade at (800) 767-2775. It will also be available on AppleLink, America Online, CompuServe, GEnie, and by anonymous File Transfer Protocol at info.hed.apple.com.

Apple, located in Cupertino, Calif., can be reached at (800) 845-5870.

Dual-processor Pentium server added to AcerAltos line

By Brooke Crothers

ACER AMERICA CORP. has introduced new Pentium servers in its AcerAltos line, including a dual-processor system.

The AcerAltos 800/p and the AcerAltos 7000/p are based on the 90-MHz Pentium processor and are replete with network and system management software, which comes bundled with the systems.

The entry-level 800/p is available now and comes with 16MB of memory standard and is upgradable to 128MB. It also includes 256KB of Level 2 direct-mapped, write-back cache memory and a 200-watt power supply.

Pricing for the 800/p will begin at $3,112.

The midrange 7000/p, available in February, supports two 90-MHz Pentiums and is board upgradable to the 100-MHz Pentium.

The 7000/p comes standard with 32MB of memory, expandable to 256MB, and 512KB of direct-mapped, write-back cache. It also features hot-pluggable drive bays and a 350-watt power supply.

Pricing will start at $5,187.

Standard features for both models include four 32-bit EISA slots, one shared EISA/PCI slot, two PCI expansion slots, a PCI SCSI controller, and a double-speed CD-ROM drive.

Acer will also bundle Acer Server Manager for NetWare, Acer Server Manager for SCO Unix, and MirrorWare with both models.

The Server Manager software is used for monitoring the server and server subsystems and provides fault detection and automated electronic "early warning" functions, among other features.

MirrorWare offers users the opportunity to link servers together, so each server acts as a data backup device to the other.

The AcerAltos line supports Novell NetWare 3.12, 4.02, and future NetWare upgrades.

A DUAL-PROCESSOR SERVER *and a host of network management features highlight Acer's additions to its Pentium-based server line.*

PCI-equipped portables

Phoenix NoteBIOS sets the stage for PCI in notebooks

By Deborah C. DeVoe

PORTABLES WILL GAIN PCI support with this month's release of Phoenix NoteBIOS 4.0 from Phoenix Technologies Ltd.

NoteBIOS 4.0 represents the first time that Phoenix has incorporated support for PCI into its portable BIOS.

A number of manufacturers have announced plans to introduce PCI-equipped portables in the first half of this year, including Texas Instruments Inc., which cited the need for PCI to support enhanced desktop features, such as multimedia.

Those companies' plans were dependent on the release of a number of component technologies that would support PCI in a portable architecture, including a PCI chip set and a BIOS.

NoteBIOS 4.0 meets the PCI 2.1 specification, which supports a 32-bit data path and a clock speed of 33 MHz.

The BIOS also supports the VESA local bus architecture, the company said.

Based on the PhoenixBIOS 4.0 architecture used in desktop systems, NoteBIOS 4.0 will help OEMs to integrate other technologies — including Plug and Play, Enhanced Disk Drive, and the upcoming Smart Battery — into portables, the company said.

Other enhancements to the BIOS include improved support for Plug and Play 1.0a and a separate software component, PhoenixCard Manager Plus (PCM Plus), that provides PCMCIA support for NoteBIOS systems.

PCM Plus is compatible with more than 250 PCMCIA cards and will support PCMCIA 3.0., according to Phoenix officials.

New features in NoteBIOS include Phoenix PowerPanel, a floating toolbar that lets users adjust power management controls with a single click.

Phoenix BIOScope, a debugging tool, is also included.

Typical implementations of the BIOS fit within 128KB; special implementations can require 256KB, the company said.

NoteBIOS uses an object-oriented architecture designed to enable OEMs to link desired components more easily, allowing for faster BIOS customization, according to the company.

NoteBIOS 4.0 is now available to OEMs. Portables using NoteBIOS 4.0 are expected in the first quarter of 1995.

Phoenix, based in Santa Clara, Calif., can be reached at (800) 677-7305.

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- *1 MB of video RAM standard, expandable to 2 MB*
- *Slimline package with two mass storage shelves and three ISA slots*
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- *Multilevel security*
- *EPA Energy Star certified*
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- *Integrated Desktop Management Interface (DMI)[3]*
- *Free three-year limited warranty for parts and labor[2]*

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- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*
- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*
- *Optional integrated 10Base-T networking*
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- *ISA Autoconfiguration utility (Plug-n-Play)*
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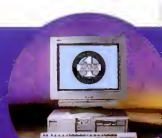

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- *Optional PCI Integrated 32-bit 10Base-T networking*
- *Integrated Desktop Management Interface (DMI)[3]*
- *EPA Energy Star certified*
- *Free three-year limited warranty for parts and labor*

intel inside

*Source: 1994 J.D. Power and Associates Desktop PC Customer Satisfaction Study™ Study conducted among business users and based on 1,528 user respondents. **Feature included with some models. All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 pre-installed; HP mouse and keyboard included. [1]U.S. list price, dealer prices may vary. Monitor not included. [2]Other capacities available. First year on-site, 24-hour service. Second and third year return to dealer. MS-DOS are U.S. registered trademark and Windows is a trademark of Microsoft Corporation. Pentium, Overdrive and the Intel inside logo are U.S. trademarks of Intel Corporation. ©1994 Hewlett-Packard Company 5963-9412*

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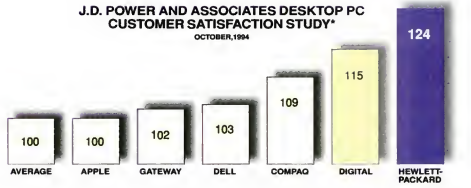

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Notebook upgrade

AST adds lithium ion battery to Ascentia

By Yvonne L. Lee

AST RESEARCH INC. this week is introducing a modified version of its Ascentia 900N notebook with a longer lasting lithium ion battery power system.

The Ascentia 910N notebooks can run for 10 hours on a single charge, compared to the 900N notebooks, which run for as long as 6 hours, depending on usage and power management options.

The notebooks use the same choice of processors and hard drives as the 900N notebooks.

The 910N notebooks come with a choice of a 10.3-inch dual-scan passive matrix color or a 10.4-inch active matrix color screen.

A third option, the 9.5-inch active matrix screen offered with the 900N notebooks, has been dropped.

AST HAS UPGRADED ITS ASCENTIA *notebook line with the 910N series, which features a longer lasting battery and an estimated base price of $2,999.*

A base model 910N with a 486DX2/50 processor, a 340MB hard drive, 8MB of RAM, and a 10.3-inch dual-scan passive matrix screen has an estimated street price of $2,999.

AST does not set list prices for its notebooks.

Other options available for the notebook include a 75-MHz Intel-DX4 processor and a 510MB or 700MB hard drive.

The 900N series notebooks, which now cost about $850 less than similarly configured 910Ns, will be phased out during this quarter, said Steve Andler, director of mobile computing products.

The notebooks ship with a number of software titles, including Lotus Development Corp.'s Organizer, an E-mail application; Delrina Corp.'s Winfax Lite and ComIt Lite; Traveling Software Inc.'s Laptop Remote Access; and connection software for access to Prodigy, CompuServe, and America Online.

The notebooks are scheduled to ship in February.

A $489 docking station compatible with Intel Corp.'s Plug and Play specification for both 910N and 900N notebooks is also set to ship then.

AST, in Irvine, Calif., can be reached at (714) 727-4141.

PRODUCT SPOTLIGHT

INTEL TO UPGRADE PENTIUM PROCESSORS

Along with rolling out 63-MHz Pentium OverDrive processors for 486 systems last week, Intel Corp. has outlined plans for a slew of new, speedy upgrade processors for Pentium systems. The planned upgrade processors will be designed for systems already based on the current lineup of 60-, 66-, 75-, and 90-MHz Pentium chips, the company said. A 120-MHz upgrade processor is designed for upgrading existing 60-MHz Pentium-based systems, with a faster upgrade planned for 66-MHz Pentium processor-based systems, Intel officials said. For the 75-MHz Pentium, a 125-MHz upgrade processor is in the works; a 150-MHz upgrade is planned for 90-MHz Pentiums, the company added. An even faster upgrade processor will appear for the 100-MHz Pentium, but Intel didn't reveal the clock speed of that chip. Users, however, have not been happy with Intel's Pentium upgrade strategy to date. "It's nice to see that Intel has finally delivered [the 63-MHz Pentium OverDrive] that was promised such a long time ago," said one IS manager at a major California utility company.

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Adaptec strives for recognition in network management

By Nancy Dillon

BRAND NAME RECOGNITION is something that has eluded Adaptec Inc., but the company hopes its new "Build a Better Server" campaign will help establish Adaptec as an I/O buzzword among corporate IS managers.

As Intel Corp. has done with the "Intel Inside" campaign, Adaptec will try to gain user loyalty, even though OEMs and VARs repackage or reconfigure Adaptec devices in such a way that they are usually invisible system components to corporate users.

> **Adaptec hopes to follow Intel's lead in making users aware of its OEM product line.**

Adaptec's marketing program features the release of three new SCSI host adapters, but it is Adaptec's Windows-based management software that is intended as the hook for chief information officers. Called Adaptec CI/O, the software boasts the capability to extend the reach of standard diagnostic programs.

It will offer profiles of network subsystems and report on SCSI host adapters and devices on a daisy chain, provided that Adaptec controller cards are being used.

Douglas Strock, a LAN administrator for Dow Corning Corp., said that such offerings might prompt him to ask for Adaptec by name.

"We have an imaging system that often has problems with SCSI devices," Strock said. "If they could offer a clear benefit in this area, I would definitely be interested."

Adaptec CI/O uses Hewlett-Packard Co.'s Open View as its GUI. A single-server version that supports Novell Inc. NetWare will ship with Adaptec host adapter kits.

An advanced version, the $199 Adaptec CI/O Professional, is due in February and will support as many as 100 servers.

On the host adapter side, the 8-bit AHA-3940 supports Fast SCSI-2 with a 10MBps transfer rate. The Fast and Wide 16-bit AHA-3940W controller supports a 20MBps transfer rate. Both are designed for entry-level and midrange systems and offer two channels and two dedicated processors.

The AHA-3940 kit will be available in February for $499. The AHA-3940W is slated for release in mid-1995.

The AHA-3985 redundant array of inexpensive drives (RAID) adapter for NetWare servers supports industry-standard RAID Levels 5, 1, 0, and 1/0.

It combines three SCSI channel processors and a RAID 5 coprocessor that offloads parity calculations from the server.

The AHA-3985 RAID adapter kit supports hot-swapping, support for a drive that can be a "hot" spare, and data transfer rates of 10MBps. It will be available in March for $799.

Adaptec, in Milpitas, Calif., can be reached at (408) 945-8600.

InfoWorld Street Prices

Desktop systems

90-MHz Pentium system[1]	Hard drive	Low	High	Average
AST Premmia GX P/90	730MB	$4,608	$5,079	$4,808
Compaq Deskpro XL 590	535MB	$4,370	$5,229	$4,658
Dell OptiPlex XMT 590	1GB[2]			$3,235 (Direct price)
Gateway 2000 P5-90 XL	1GB[2]			$3,439 (Direct price)
HP Vectra XU 5/90C	540MB	$4,200	$4,712	$4,400
IBM PC 750	540MB	$3,854	$4,651	$4,080
Zeos Pantera Pentium-90	720MB			$2,895 (Direct price)
Zenith Z-Station EX	540MB	$3,199	$3,798	$3,417
Clones/compatibles[3]	730MB	$2,195	$3,055	$2,673
PowerPC system[4]				
Apple Power Macintosh 8100/100	**1GB[2]**	**$4,058**	**$4,829**	**$4,282**

InfoWorld street prices are based on telephone surveys of resellers and on print advertising in computer publications and regional newspapers. Price information was collected between Jan. 15 and Jan. 21.

1. Pentium systems include DOS, Windows, keyboard, mouse, 16MB of RAM, and 15-inch color monitor. The Dell system includes a double-speed CD-ROM drive, and the Gateway and Zeos systems include a quadruple-speed CD-ROM drive.
2. Gigabyte
3. Clones and compatibles have the same features as those systems listed by name but are not as widely available.
4. Power Macintosh prices include a 100-MHz PowerPC 601 microprocessor, 16MB of RAM, System 7.5, mouse, and a double-speed CD-ROM drive, but do not include keyboard and monitor.

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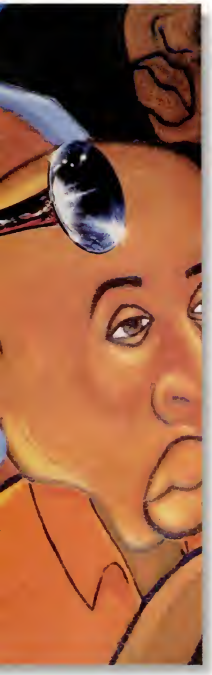

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HELP DESK · BRETT GLASS

Work-arounds can hold you over until Pentium is replaced

Do all speeds of Pentiums (60 MHz, 66 MHz, 75 MHz, and 90 MHz) have the math problem? How does one take advantage of the alleged recall?

Roger S. DeReu

All speeds of Pentiums introduced to date were affected by the floating-point unit bug. To participate in Intel's exchange program (yes, it really does exist), call (800) 628-8686.

InfoWorld columnist Robert X. Cringely reports that replacement chips are slow in coming, though, so in the meantime you may want to find out if there are work-arounds for your current number-crunching applications. (See Notes from the Field, Jan. 16, page 106.)

Often, you can get around the problem by including a command-line switch that forces software floating-point emulation. This makes calculations slower, to be sure, but the effect is not that noticeable on a fast processor.

I'd like to publish a list of fixes in an upcoming column, so if you know of a work-around for a popular spreadsheet, compiler, language interpreter, database, operating system, or what have you, please send me E-mail at Internet address brett_glass@inforworld.com and let me know.

I'm looking into using CheckFree Corp.'s automatic bill-paying and check-writing service to handle some business and personal accounts. Is it reliable? Does it integrate with accounting software?

Angela McKinney

For my own business, I use CheckFree ([800] 882-5280) to pay bills. I have mixed feelings about the service. When it works, it works very nicely: I can schedule payments when an invoice arrives, checks are mailed automatically to arrive on the due date, and yes, I can export data into spreadsheets, financial programs, and bookkeeping software. (Some software products, such as Intuit Inc.'s Quicken and Meca Software Inc.'s Managing Your Money, have CheckFree support built in.)

However, the service has some severe shortcomings. For example, it's tough to place much identifying information on a CheckFree check; there's no place for a note or comment, and the account number field doesn't even have enough room for the account number that appears on a typical magazine subscription invoice. The result: CheckFree payments are often credited to the wrong account by the payee. You cannot select a number for a check; instead, a seemingly random number appears in the upper right-hand corner, causing your bank statement preparation software to list the check out of sequence.

Finally, if CheckFree makes a mistake, the company is often completely unresponsive to queries and complaints. It took me two weeks to resolve a problem when a recent mortgage payment was inexplicably made twice, leaving my account dangerously short of cash. I sent repeated E-mail messages to CheckFree (a feature built in to CheckFree's software) but received no response. Frustrated, I called to report the error and discovered CheckFree's support line was not open on weekends (even though most users probably do their personal finances at that time), required long waits on hold, and was not toll free.

On another occasion, when I was forced to restore files from a backup tape after a hard disk crash, the CheckFree software wouldn't work for several days (despite assurances that it would be fixed within two days). Similar problems occurred when a payment arrived late and when another did not arrive at all: I received form-letter E-mail responses asking that I contact the payee.

An automatic check-writing service is a wonderful idea, but CheckFree's implementation definitely needs work. I'm hoping that competition will force the company to provide better service in the future.

Brett Glass' Help Desk answers business computing questions. Readers can leave queries by calling (800) 227-8365, ext. 702, or by messaging CompuServe at 72267,3673.

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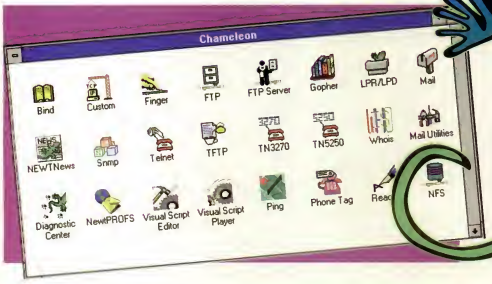

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  - NFS Client & Server
  - LPR/LPD
- Electronic Mail
  - SMTP Mail with MIME
  - Phone Tag
  - IBM PROFS
  - POP2, POP3, SMTP
- Internet Access
  - Gopher
  - Newsreader
  - Whois
- Network Utilities
  - Ping
  - Finger
  - Diagnostic Center/Trace Agent
  - DNS Client & Server
- WinSock TCP/IP
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PIPELINE

SHIPPING

Users of portable PCs no longer need to trip over meters of cables thanks to the introduction of Multi-Tech Systems Inc.'s MT2834LT PCMCIA modem. The $399 modem uses a duplex phone connector, called "CoolJax," so users need only a single cable to connect the PCMCIA modem. The MT2834LT operates at 28.8Kbps and complies with the recently ratified ITU standard for 28.8Kbps V.34 modems. The modem also supports all lower speed standards. (800) 328-9717.

A new Ethernet-to-Ethernet routing hub for Macintosh and Unix LANs is now shipping from NETSPAN CORP. The MultiRouter EN can interconnect networks running Internet Protocol (IP) and AppleTalk Phase 2 with similar networks for a price comparable to buying an additional PC. The MultiRouter EN costs $1,895 for AppleTalk Phase 2 only and $2,095 for AppleTalk plus IP. (214) 690-8844.

LICENSED

NETWORTH INC. has licensed Epilogue Technology Corp.'s remote monitoring (RMon) source code to develop network management agents for use in its Ethernet stackable hubs. The company plans to incorporate the RMon code into its Series 6000 Switching and Network Series Hubs and its Series 4000 MultiSegment Hubs. (214) 929-1700.

ANNOUNCED

DIGITAL EQUIPMENT CORP. and ISOCOR announced the integration of two products to enable them to link Lotus cc:Mail and Notes, and Microsoft Mail to industry-standard X.400 messaging systems and the Internet. Using Digital's Mailbus 400 and Isocor's series of Isogate X.400 gateway products, users can integrate disparate messaging systems with global networks via the Simple Mail Transfer Protocol (SMTP). Pricing for Mailbus 400 software ranges between $8,000 and $20,000. The Isogate series of gateways starts at $2,450. Digital is at (508) 493-5111 and Isocor is at (310) 476-2671.

Lotus ships Video for Notes

■ Server software distributes video clips across LANs

By Doug Barney

(ORLANDO, FLA.) Lotus Development Corp. announced and shipped its long-awaited video server for Lotus Notes last week.

Lotus Video for Notes, Release 1.0, enables users to integrate digitized video with other data types in the Notes environment. Video clips stored on Notes servers can be distributed across LANs and WANs and appended to Notes documents.

The first release of Video for Notes runs only on IBM OS/2 Notes servers and requires separate Video for Notes Windows client software in addition to the standard Notes client. Lotus has not announced plans to port to other Notes client or server platforms.

Video for Notes stores video clips on Notes servers and transmits them to clients as required to minimize use of client PC resources. When a user invokes a video clip from within a Notes application, a pointer locates where the video data is stored and the clip is displayed on the client PC.

Clips can also be played from CD-ROM. Users with CD-ROM mastering equipment can copy video clips to CD-ROM; clients can then access and play the clips from the CD-ROM drive.

The Video for Notes interface is based on a VCR metaphor; it allows users to distribute and play existing video clips and record, capture, and edit new ones. Video will be played back in real time over high-capacity networks; on slower networks, where real-time transmission and playback is not possible, clips will be downloaded to clients and played in real time.

Users are pleased with its performance.

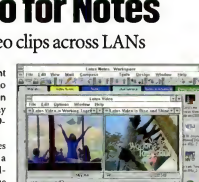
"It worked like a dream for us," said beta tester Richard Vigilante, director of the Information Technologies Institute at New York University. "I was surprised at how well it played on client machines."

Using a standard 486 system, Vigilante was able to play 320-by-240 video at 15 frames per second.

Video for Notes requires Notes 3.15 or later client software and Notes 3.2 or later server software. It requires a 486 and a VGA screen but needs no special hardware for playback on Notes clients. Users also need a video server system, such as Starlight Network Inc.'s StarWare or Novell Inc.'s Video Notes.

Video for Notes costs $2,695 per server and $120 per client.

Lotus, in Cambridge, Mass., is at (800) 343-5414.



LOTUS VIDEO FOR NOTES *users can distribute and play existing video clips and record, capture, and edit new ones.*

Video server compatible with Lotus Video for Notes

StarWorks offers video LAN broadcasting

By Karen Rodriguez

STARLIGHT NETWORKS INC. has announced an upgrade to its StarWorks video server that offers real-time broadcasting to users across enterprise LANs.

StarWorks 2.0, announced last week at ComNet '95 and shipping since December, is aimed at corporate enterprise networks where large-scale multimedia applications for communications and training are becoming as critical as productivity applications.

The server-based software, which operates on PCs, Macintoshes, and Sun Sparcstations, allows users to view live video sessions and stored digital video files across the LAN.

Lotus Development Corp. announced last week Video for Notes, an application that lets users add video to Notes applications. (See story above.) The initial implementation of Video for Notes will support Starlight's StarWare video server, a NetWare Loadable Module-based product shipping since October 1993.

The StarWorks PC client, which uses Microsoft Corp.'s Video for Windows, runs StarWorks-TV software, which digitizes analog signals from sources such as camera, TV, or VCR, and multicasts digital video streams over the LAN.

The one-way broadcast feature can be used for applications such as distance learning, remote monitoring of unattended manufacturing processes, and distribution of corporate communications and news programs.

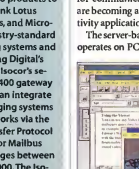
StarWorks 2.0 is being tested at an aerospace company in El Segundo, Calif., which will run video over its FDDI and switched Ethernet LAN. It is also being considered by Rockwell International Corp. and McDonnell Douglas Corp. because of its high-quality video streams and capability to distribute video-on-demand to the desktop cost-effectively, said Bill Farhood, president of BF DataCom, which resells the Starlight product and installs high-speed networks.

Features include increased storage capacity of 400 gigabytes and support for FDDI connections and 100Base-VG for 100Mbps speeds.

StarWorks-TV supports Intel Corp.'s Indeo digital video standard and JPEG compression algorithms. MPEG support is due later this year.

StarWorks is priced starting at $4,495 for a package that includes server software and DOS/Windows or Mac clients, StarWorks-TV Broadcaster, and a license for five simultaneous viewers.

Starlight, in Mountain View, Calif., is at (415) 967-2774.



STARWORKS 2.0'S *broadcast service enables users to integrate live video with applications.*

NRC WILL SHIP WORKGROUP ETHERNET SWITCH

By Bob Wallace

NETWORK RESOURCES CORP. (NRC) will ship next month its MultiGate Switch, a 12-port workgroup Ethernet switch that will enable network managers to offer individual end-users and LAN segments dedicated 10Mbps bandwidth. Per-port pricing for the switch starts at $600.

"It sounds like a solid, fixed-port switch at a competitive price, but there are vendors, such as Kalpana Inc. and Amber Wave Systems Inc., that offer similar switches for under $500 per port," said Skip MacAskill, a senior research analyst with the Gartner Group Inc.'s network technologies unit in Amherst, N.H.

The MultiGate Switch has a 1.2-gigabit-per-second backplane to process packets.

Its 12 Ethernet ports can house any mix of 10Base-T (twisted-pair), 10Base-2, and 10Base-F (fiber) modules.

Ethernet switch market
(projected in revenue)

1994	$330 million
1995	$1.04 billion
1996	$2.02 billion
1997	$2.70 billion

SOURCE: DATAQUEST

"Media flexibility is important," MacAskill said.

The NRC switch can also be equipped with a 100Mbps interface that can be used to link it to servers or hubs attached to backbone networks. It supports routing of Internet Protocol, Novell's IPX, and Apple's AppleTalk data.

The switch has a standard filtering security feature, which enables network managers to set access privileges on a per-user basis.

The switch can be managed locally using its built-in console port or remotely over a network using Telnet, or from an SNMP-based system.

NRC will face an uphill battle with entrenched Ethernet switch vendors including Kalpana — now owned by Cisco Systems Inc. — Amber Wave, NBase Switch Communications Inc., Network Peripherals Inc., and PlainTree Systems Inc., MacAskill said.

A base configuration 12-port MultiGate Switch with one 100Mbps backbone port costs $7,995. Single-port interfaces for 10Base-2, 10Base-T, and 10Base-F are $195, $195, and $395, respectively.

NRC, located in San Jose, Calif., can be reached at (408) 383-9300.

Lotus Fax Server gives cc:Mail, Notes users better fax gateway services

By Doug Barney

ORLANDO, FLA.) The days of running to check the fax machine and hot-keying between applications to send and receive faxes are over, at least for users of Lotus Development Corp.'s cc:Mail and Notes, the company said last week.

The Lotus Fax Server (LFS), announced last week at Lotusphere, will allow users to send and receive faxes from within cc:Mail and Notes. LFS Notes Edition will sell for $2,499; LFS cc:Mail Edition will cost $1,475.

Both versions are scheduled to ship within three months. Current users of the cc:Fax 1.2 can upgrade for $475; users of Notes Outgoing and Incoming Fax Gateways can upgrade for $795.

LFS enables users to send and receive faxes over E-mail backbones, providing a single interface for desktop communications. Lotus said the product will reduce costs for users because they can reduce the total number of communications links required for fax and E-mail communications.

Third parties are already preparing add-on products for LFS. Nestor Inc. last week announced NRoute, a $2,500 product that routes inbound faxes simply by reading fax routing slips and cover pages. The Windows-based software is designed to recognize names on the fax sheet and match them with the right E-mail address.

LFS users can also manipulate and view faxes using Lotus' fax viewer software. Faxes can be printed directly from any mail-enabled Windows program using the print-to-fax driver. The system also supports some automatic fax routing through Direct Inward Dial and Dial Tone Modulation Frequency systems.

Several features in LFS are designed for network administrators. Administrators with mixed cc:Mail and Notes mail environments need to support only one fax feature set because much of the code is common to LFS, cc:Mail, and Notes versions.

In addition, administrators do not have to manage separate fax and E-mail directories because fax numbers are treated the same way as E-mail addresses and are added to the mail directory, rather than to a fax phone book.

LFS requires a 386 or higher PC with 16MB of RAM running Windows 3.1 .

Lotus, based in Cambridge, Mass., can be reached at (800) 346-1305. Nestor, based in Providence, R.I., can be reached at (401) 331-9640.

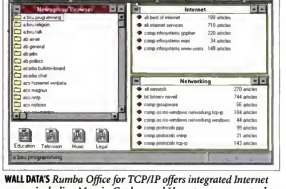
Wall Data improves TCP/IP

■ Rumba Office integrates Internet access

By Nancy Dillon

JUST AS THE RUMBA is a Cuban dance based on a basic pattern of steps, new releases of Wall Data Inc.'s Rumba Office are variations on a theme.

Scheduled to begin shipping next week, Wall Data's latest release, Rumba Office for TCP/IP, will preserve the basic Rumba Office terminal emulation front end and add performance enhancements aimed at TCP/IP users.



WALL DATA'S *Rumba Office for TCP/IP offers integrated Internet access, including Mosaic, Gopher, and Usenet news group tools.*

Users who have waited for improved connectivity will get a Windows Virtual Device Driver TCP/IP client stack. The stack reduces the toll on DOS memory and improves TCP/IP data exchange between servers and IBM mainframes, AS/400s, Digital VAXes, and Unix systems.

Rumba Office for NetWare already includes a free copy of Novell Inc's LAN WorkPlace for DOS TCP/IP stack, which enables users to run TCP/IP over NetWare.

Another feature in the new TCP/IP version is Internet access. The application incorporates Mosaic, Gopher, and Usenet news group tools into the Rumba Office interface.

"Packaging the Internet with Rumba Office will be convenient for users who want a consistent interface, but this sounds a little bit like a bells and whistles add-on to me," said Mary Petrosky, a network computing analyst with The Burton Group, in Salt Lake City.

"I don't necessarily think this is technology that people with mainframe data want, although if there are pockets of folks on a network who could use it, and the cost stays low, then why not?" Petrosky added.

A single-user version of Rumba Office for TCP/IP networks will cost $400. The mainframe edition will cost $300 and the VAX edition will retail for $250.

Wall Data, in Kirkland, Wash., can be reached at (206) 814-9255.

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Token Ring modules

Bay Networks cuts module prices

By Bob Wallace

BAY NETWORKS INC. last week announced price cuts ranging from 6 percent to 25 percent on Token Ring components for its SynOptics high-end and midrange chassis-based hubs. The price cuts are on Token Ring modules for the 14-slot System 5000 hub and the 12-slot System 3000 hub.

"The Token Ring market has been somewhat flat, but we feel that's starting to change, and lowering [product] prices should help that along," said Gary Law, director of market development for Bay Networks.

Analysts said they are seeing a growth in demand for Token Ring products.

"The big vendors are beginning to realize that this is an important market, and that it's just not enough to throw products at it, [products] have to be price competitive," said Kathryn Korostoff, president of Sage Research Inc., in Natick, Mass. "They're seeing smaller vendors develop complete product lines."

Bert Williams, product manager with Bay Networks, said Token Ring module prices for the SynOptics System 5000 hub previously ranged from $1,995 to $6,995. New prices will range from $1,495 to $5,995.

For example, the price for the Model 5502 24-port Token Ring hub module has been reduced from $3,595 to $4,495.

Prices for SynOptics System 3000 Token Ring modules previously ranged from $1,295 to $6,595. Prices now range from $1,095 to $6,195.

Bay Networks has also cut prices for other Token Ring connectivity products. For example, the price for the Model 3174 Workstation Controller, which links 3270 terminals to IBM hosts, has been cut from $11,995 to $8,995.

Bay Networks has cut the price of its 5510 Token Ring Network Management Module, which comes with one Data Collection Engine (DCE), from $6,995 to $5,995. The module can support two DCEs, which gather topology and remote monitoring data. The price of add-on 5511 Token Ring DCEs has been cut from $1,995 to $1,495.

The price of the 3513 Token Ring Network Management Module for the System 3000 was dropped from $3,495 to $3,195.

The 3514 Token Ring Network Management Module with a fiber-optic repeater for the same hub now costs $3,995, down from $4,995.

Bay Networks can be reached in Billerica, Mass., at (508) 670-8888, and in Santa Clara, Calif., at (408) 764-1180.

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Memo to: Bob Metcalfe From: Ed Foster Re: Your Tom Kalil column

Bob, just between you and me (and the 250,000 readers of *InfoWorld*), I'm having a bit of a problem figuring out how to respond to your request for us to comment on Tom Kalil's "anchor tenancy" proposal. (See From the Ether, Dec. 26, 1994/Jan. 2, 1995, page 51.) My basic problem is that I want to keep intact my record of being 180 degrees opposed to any of your political stands, but I'm finding it hard to do in this case. On the face of it, Kalil's proposal to have local postal offices buy Internet connectivity from local rural providers, thereby reducing the high access costs for you and your local elementary school in Maine, seems reasonable. And the vision of you in lockstep with a member of the Clinton administration, marching together toward an electronic democracy with equal access for all, portends an alliance that even the most powerful forces would hesitate to oppose. Even Newt. Even Bill. (Gates, that is.)

But, what the heck, I'll try.

You say the refreshing thing about Kalil's proposal is that it does not seek to subsidize rural connectivity. I think, though, it's obvious that it is a form of subsidy. Will rural post offices buying expensive Internet connectivity from local providers roll back the cost of a stamp to 29 cents? I don't think so. More likely, it'll raise it another fraction of a penny.

That means ultimately I'll be subsidizing your Internet access. And my Bay Area neighbors will be subsidizing your neighbors in Maine. Most of my neighbors pay higher rent than most of your neighbors because we live in an urban area. Why shouldn't we pay less for Internet connectivity? It's a natural consequence of the free market forces that you love so dearly.

If I didn't know better, Bob, I'd have to accuse you of being the typical conservative hypocrite who opposes all government handouts save for those where you and your friends get to be first in line for the dole (not Dole, Bob).

But I do know better, Bob. You're much too thorough and honest a thinker not to see that Kalil's post office idea is a government subsidy that you must reject. So why are you making it sound like you think Kalil's idea is worth consideration?

Well, I suspect it's because you're not so honest that you're above throwing out a red herring or two for purposes of political propaganda. By associating Kalil's basic idea of anchor tenancy with subsidizing rural connectivity through the post office, you're hoping to give the whole concept of anchor tenancy a bad name.

I don't know what Kalil and the Clinton administration have in mind for anchor tenancy beyond using it to drum up a little support among the rural techno-scion constituency. But I like the idea of anchor tenancy as a way of giving more folks access to the Iway. The post office is just the wrong tenant.

We have wonderful proof that anchor tenancy works, because it is, after all, what got the Internet built in the first place. The tenant wasn't the post office, but the Department of Defense and the academic community, both liberally (as it were) spending taxpayer dollars. Where were the watchdogs decrying government involvement in the data infrastructure then? I don't know, but it's a good thing for both of us that they weren't to be found. Had we waited for free enterprise to build the Internet, we would have no incipient Iway to which you could devote your attentions.

In my typical knee-jerk liberal fashion, I even have a candidate for the anchor tenant whom we should subsidize instead of the post office: that local elementary school in Maine you mentioned. And, of course, the elementary schools in Oakland, Peoria, and everywhere else in the country as well. We'd have to start by making sure they have the equipment to take advantage of cheap Internet access, but getting more computers in schools is a worthy goal in itself. Universal and cheap access to an expanded Internet would just be a happy by-product.

That's not a popular stance to take in the Age of Newt, I know, but at least I've made my position clear. Now how about you, Bob?

Ed Foster is editor of InfoWorld. *He gets E-mail at ed_foster@infoworld.com or at MCI account 548-3453. Send gripes about vendors to gripe@infoworld.com or call (800) 227-8365, ext. 710.*

WILL MICROSOFT'S APPLICATION DEVELOPMENT TOOL *Visual Basic 4.0 be limited or revolutionary? Is its soon-to-be rival Powersoft PowerBuilder open or closed? These questions, posed in Stewart Alsop's column (see Distributed Thinking, Jan. 16, page 106) unleashed a flood of responses. Most readers defended PowerBuilder as the best. But current Visual Basic users, if in the minority, were equally loyal. Then there's the matter of "underware" — Linux Unix brand, that is. We see London, we see France, we saw Nicholas Petreley's Jan. 16 column and loved it, too.*

Visual Basic's got limits

NO, I WOULD NOT use Visual Basic to build a real application (as opposed to a prototype) because I've done it. I found the project went very fast for the first four or five weeks. At that point I started running into the limits of Visual Basic. These limits are inherent, and I do not believe 4.0 can or will eliminate them.

I would recommend Visual Basic for a job that is scheduled to take no longer than two weeks. Then, when it ends up taking four weeks, you'll have a little room left before you get to real problems.

Terry Turner
Menlo Park, Calif.
tnt@netcom.com

VB 'instant convert'

WITHIN the past year, I purchased Visual Basic Professional 3.0 and became an instant convert. Much of its appeal results from the ability to purchase third-party controls. Run into a roadblock and just pick up the Visual Basic Programmer's Journal and find a custom control: version stamping, tabbed dialogues, source management.

We have an OEM for R&R Report Writer, Solomon Software. It is one of the first vendors of midrange accounting software to jump on the Visual Basic bandwagon. Why? The open architecture. The company believes it will be able to improve its accounting products by having the flexibility of including third-party controls to solve complex problems that a closed architecture would not support (often because the vendor doesn't understand his customer's problem).

As a shareholder in Powersoft, I've been mighty happy. I've also been selling. Down the road, closed architectures, whether hardware or software, are destined for obsolescence. Visual Basic's Open Database Connectivity support isn't quite there yet, but have no doubt that Microsoft will continue to improve the product and soon get it right.

John J. Henderson
CEO, Concentric Data Systems Inc.
Westborough, Mass.

PowerBuilder is open

I CONTEND THAT PowerBuilder is an open environment. PowerBuilder 3.0 can use VBX 1.0 controls, controls in DLLs, and invoke functions that are encapsulated in DLLs. PowerBuilder 4.0 (now shipping) incorporates an OLE 2.0 control that can be placed on a window and used in applications (although I don't think its an OLE custom control). In terms of Visual Basic vs. PowerBuilder, Visual Basic isn't even in the same league as PowerBuilder. For Visual Basic to even become a player in this game it would have to start by first providing the object-oriented functionality that PowerBuilder provides.

Eric Stephens
Syracuse, N.Y.

A feature forgotten in debate

WE HAVE STARTED DOWN the road of building mission-critical applications with PowerBuilder. What I find interesting is that some companies are prototyping with Microsoft's Visual Basic and then going to PowerBuilder. I find that PowerBuilder itself will allow you to do prototyping pretty quickly, and I don't see the need to use Visual Basic for this.

We would not readily change to Visual Basic from PowerBuilder unless there was some great feature that Visual Basic provided that PowerBuilder did not. One thing that is overlooked frequently in the Visual Basic/PowerBuilder debate is that PowerBuilder easily allows the use of proprietary interfaces with the database engines. It also allows Open Database Connectivity, but I find the proprietary interfaces to be quicker and allow for all the data types and SQL extensions that the database engine companies' provide.

I think it is good Visual Basic is starting to put pressure on PowerBuilder. Competition makes for better products all around — and less expensive too.

Kent Brye
Madison, Wis.

Linux supporter roars

ALTHOUGH I FOUND most of Nicholas Petreley's column to be fair, I do want to take issue with one point. (See Down to the Wire, Jan. 16, page 104.) He said, "So we've arbitrarily ranked it [Linux] at some nebulous level below commercial software, at least as far as how it is developed, updated, and supported."

I find Linux development and support far superior to that of most commercial companies. There are thousands of independent programmers worldwide working on Linux daily. When a bug is discovered, there is usually a fix posted within a day (or hours).

Sure, there is no entity you call for generic support. But many of us prefer support over the 'net. And source code is openly available for Linux, so you can do your own support.

Brian Lantz
Tampa, Fla.

Linux caveat

I JUST READ Nicholas Petreley's column about Linux installation, and I have a little caveat to add: I have a 1-gigabyte hard drive with five 100MB file allocation table partitions for DOS/Windows, one 200MB partition running Windows NT Workstation 3.5, and 200MB of free space. Should be a no-brainer for where Linux will go: the 200MB of free space at the end of the drive. After hours of installiun ad tedium, I finally got a system

Write to us

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installed and working from the command line. However, when I rebooted to go back to the NT partition just to check, I got NTOSKRNL.EXE missing or corrupted. I installed a correct version and had a major system hang. I had to delete the Linux partition to get NT back. I am still trying to hammer out the problem, but no fix yet.

Steven Kruger
stevepk@netcom.com
Mountain View, Calif.

AppleSoft balks at Hot Seat

IN AN INTERVIEW published in *InfoWorld* (see "Digital designs," Jan. 16, page 27), Bud Colligan questioned Apple's support for the Kaleida Media Player and ScriptX. As the person responsible for directing Apple's operating system and application software development, I can assure your readers that Kaleida technology will play a key role in future Apple products.

At Macworld Expo earlier this month, Apple invited Kaleida Labs to demonstrate their currently shipping product to a meeting of more than 500 multimedia developers. The attendees saw firsthand how Kaleida's object-oriented approach expands the possibilities for content developers. They also heard Apple reiterate its commitment to include the Kaleida Media Player in future Apple systems and to develop easy-to-use tools that will put the power of ScriptX in the hands of creative professionals.

Kaleida has produced a platform-independent standard that removes technical barriers to multimedia innovation. If I were a content developer, I'd definitely look into it. One final thought: Readers might ask why Bud might be as emotional as he appears on the topic of a competitor that has just entered the market and interpret his comments accordingly.

David Nagel
AppleSoft
Cupertino, Calif.

Product comparison 'unfair'

IN INFOWORLD'S REVIEW of notebooks, NEC Technologies Inc. found a wide range of inaccuracies, errors, and test design flaws. (See Product Comparison, Nov. 21, 1994, page 82.) It is our opinion these errors resulted in our Versa M/75C product being very unfairly compared to other notebooks in your final grading.

As a participating vendor, we request that you re-evaluate your testing procedures and product comparison chart in all areas, including multitasking, battery life, capacity, screen quality, price, and support policy. By doing so, we believe you will agree that significant errors were made.

Realizing space is limited, I have, under separate cover, provided your test center with a detailed explanation of where mistakes occurred for review and consideration.

NEC Technologies is eager to participate in *InfoWorld*'s comparative reviews. However, we also reserve the right to point out substantial errors and request redress if proven right. We look forward to your response.

Robert Levin
Portable Systems Group
NEC Technologies Inc.

In reviewing NEC's complaints, we have found that mistakes were made in the 75-MHz DX4 notebook comparison which adversely affected scores of the Versa M/75C in some, although not all, of the scoring categories mentioned. *InfoWorld* regrets the errors and will in the near future publish a corrected review of the product. — Editors

FROM THE ETHER · BOB METCALFE

How many sysops will show up for BBSCon — and just what is a sysop?

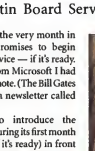
Which Bill Gates? That's what the organizers of BBSCon asked when I recently suggested Bill Gates as a keynote speaker. Did I mean *the* Bill Gates, or the other one, from Microsoft? Well, ONE BBSCon, the Online Networking Exposition and Bulletin Board Service Convention, will be in Tampa, Fla., this August, the very month in which Microsoft now promises to begin offering a new on-line service — if it's ready. So it was the Bill Gates from Microsoft I had in mind for a BBSCon keynote. (The Bill Gates of BBS fame is editor of a newsletter called *Midnight Engineering*.)

What better time to introduce the Microsoft Network than during its first month of availability (but only if it's ready) in front of 15,000 BBSCon attendees, mostly on-line bulletin board system operators (sysops)?

Of course, nobody can guarantee 15,000 sysops will attend the next BBSCon.

Last August nearly 4,000 showed up in Atlanta. During a BBSCon planning meeting at a spa in the Colorado mountains, we wondered aloud if the outdoor Jacuzzi whether this hot little conference would again more than double — for the fifth year in a row.

Some would say *InfoWorld* readers are not likely attendees of BBSCon, where amateurism, tinkering, pornography, piracy, and libertarians run rampant among the BBS



sysops and their callers.

But after BBSCon in Atlanta, I'm not so sure. Consider that in our 1994 Iway Poll, *InfoWorld* readers said they are quite a bit less familiar with information superhighways, on-line services, and even the Internet than they are with, yes, BBSes.

Jack Rickard, editor and publisher of *Boardwatch Magazine* and co-organizer of BBSCon, estimated that last year in the United States there were 60,000 BBSes that would welcome a call from a stranger. And there were 17 million callers.

But that was last year — with many of the BBSes in companies such as those served by *InfoWorld* readers — and that didn't count closed BBSes. Phil Becker, president of eSoft Inc. and the other co-organizer of BBSCon, getting into the swing of Internet math, estimates within a straight face that there are now 250,000 BBS sysops.

So, using a Pentium Windows calculator, I estimate that 15,000 sysops will flood the Tampa Convention Center for their annual network bacchanal. I estimate this because 250,000 is a large and growing number; because commercial on-line services, the Internet, and BBSes are multiplying and converging; and because, like me, 89 percent of last year's BBSCon attendees say they intend to return this summer. For more information about this year's BBSCon, to be held Aug. 16-20 in Tampa, call (303) 693-5253.

Which brings us to differences among on-line services, BBSes, the Internet, and their respective sysops. I used to think that a BBS sysop would know chips, modems, and the server software running on his PC, whereas an on-line sysop would know the lifestyle, politics, hobbies, or product preferences of her callers. I was updated on this by Steve Larsen from that biggest on-line Internet BBS service in the sky, Prodigy. Today's sysop knows less about byte piping and more about content than ever before. But, his defining expertise, her core competence, is neither of these. It's an art called community building.

Sysops at BBSCon are of three kinds: hobbyists who set up BBSes for fun, entrepreneurs who set up BBSes for profit, and us *InfoWorld* types who set up BBSes for service to the employees and customers of our companies. In short, sysops are community builders.

The World Wide Web is also part of the BBS phenomenon — or vice versa. BBSes are going on the Web. Prodigy, for example, already offers on-line content to Internet Web browsers and Web browsing to its callers. BBS sysops and callers will soon be indistinguishable from — as many of you want to call them — Web spiders and flies. I see BBSes serving in increasing numbers as both local front ends and content providers for the Web.

So come see for yourself at BBSCon. And see maybe *the* Bill Gates or maybe the other Bill Gates. But for sure come and see me, *the* Bob, and I don't mean that new Windows GUI for happy-go-lucky nincompoops.

Bob Metcalfe invented Ethernet in 1973 and founded 3Com Corp. in 1979. He receives E-mail at bob_metcalfe@infoworld.com via the Internet.

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Looking for the right Internet Connection

By Glenn Fleishman

Finding Internet service providers has never been easier; they are blossoming everywhere as interest in the network booms. However, selecting the one that is right for your business is getting tougher: many local, regional, and national services are vying for your attention with a laundry list of services and rates.

Consider protocols, pricing, speeds, and reliability when selecting a service provider.

The good news is that as more businesses connect to the Internet, the service providers are becoming more accountable and professional.

Regional providers, saddled with the reputation for being fly-by-night operations, are taking steps to shed that image by improving support and other services. These local and regional Internet service providers (ISPs) are able to offer customers the same level of access to Internet news groups and E-mail as national providers, often at lower costs. And, because regional providers serve only a specific area, they may offer better, faster connections for customers.

Still, selecting an Internet service provider isn't simple. If you thought choosing a long-distance phone carrier was tough, you'll want to wait out this dance. You'll have to consider types of protocols, phone and access charges, and connection speeds. As with any rapidly growing area, the boom times are sure to be followed by some busts.

BOOM TIMES. In just one year, the Internet services world has changed dramatically. The December 1993 compilation of public access dial-up providers listed 80 vendors. One year later, the Internet Network Information Center (InterNIC) list cites more than 290 providers across the United States. Now, especially after the massive growth in late 1994, most major U.S. cities and hundreds of smaller municipalities have consistently usable service.

At the same time, many of the larger telecommunications and "traditional" commercial on-line services have begun offering, or have announced, Internet-based dial-up services. Recently, MCI Communications Corp. entered the fray with internetMCI and related services; and both CompuServe Inc. and America Online plan to offer direct Internet Protocol (IP) dial-up accounts soon.

▸ For information on Internet servers, see product comparison, page 68.

Additionally, the new competition has prompted older national providers to improve services and expand their national presence via public X.25 networks and statewide points of presence (POPs).

National providers are also adding local dialing centers to their businesses on a weekly basis. For example, CompuServe Packet Network (CPN) and SprintNet, two of the largest public X.25 providers, have stepped up efforts to increase the availability of 14.4Kbps modems in all of their POPs.

CONNECTION BASICS. All providers surveyed for this article offer direct IP connections through SLIP (Serial Line Internet Protocol) or PPP (Point-to-Point Protocol), or through a proprietary equivalent.

SLIP and PPP are two similar methods of encapsulating TCP (Transmission Control Protocol) packets to go over a modem line, ISDN, or another telecommunications connection. SLIP, the older of the two, can be confusing to set up for even an advanced user. PPP by comparison is simpler to set up, taking just a fraction of the time. It can also handle more types of traffic. PPP's more robust nature and ease of configuration have made it the method of choice for national providers; many local providers are turning to it as well.

Some early providers have offered "shell" or "interactive" accounts that simplify navigation through a selection of Internet services. However, none of the newer national providers offers these shell accounts and regional ISPs are moving away from such features.

To simplify connections, ISPs may offer customized software packages to their users. IBM's OS/2 Warp comes preconfigured to hook into the Advantis system. OS/2 Warp can also be easily configured to dial into another provider thanks to its TCP/IP stack.

The Pipeline, on the other hand, uses a proprietary graphical front end that integrates all client functions in a single application (see story, page 58). Although MCI provides its own graphic starter kit, customers are not required to use it exclusively, says David Sutton, a spokesperson for MCI Business Markets.

WHAT YOU FIND ON-LINE. More than 12,000 news groups in regional and topic-oriented hierarchies produce as much as 300MB of postings per day. Among them are the Big Seven Usenet news groups, including comp (computers), sci (research science), misc (miscellaneous), soc (social issues and socializing), talk (debate-oriented), news (news network and news software), rec (art, hobbies, and recreation). All of the providers surveyed offer the Big Seven and usually the

entire alternative hierarchy (alt.*); some offer the entire feed.

An important complement to these non-commercial discussion groups is The ClariNet, offered to ISPs by ClariNet Communications Corp. For a monthly fee, ClariNet collects and sorts news feeds from The Associated Press, Reuters, NewsBytes, and other services into hundreds of topic-based news groups and sends out a constant stream of information to its customers.

"By feeding the news directly into our subscribers' servers, we give them direct local access to information. They don't have to go out to another computer to get it," says Brad Templeton, ClariNet's founder and publisher.

Smaller ISPs may subscribe to ClariNet's midlevel offering, which includes general features but nothing from Reuters and only a subset of AP On-line. Larger providers, such as Netcom and The World, add Reuters and AP On-line packages.

Of course, the Internet is used mostly for sending E-mail. Current estimates place the number of users exchanging E-mail across the Internet (either directly or via gateways) at more than 30 million worldwide. Most ISPs provide unlimited E-mail services, although a mailbox for storage may be included in the local storage fees for regional ISPs (see chart, page 56). This is a contrast to many commercial services, which charge a per-piece or per-kilobyte rate for sending and receiving E-mail across the Internet.

SPEED DEMONS. Most connections are through 9600bps and 14.4Kbps modems, especially when the user dials into a national provider through a local POP. Several national providers that run their own networks are phasing in 28.8Kbps modems over the next year as usage increases. An advantage to local and regional ISPs is that most currently offer some 28.8Kbps modems.

Only a few ISPs currently offer single-channel or 64Kbps ISDN. Support for ISDN is more likely to come from local providers, which do not have to consider how different phone companies have tariffed and implemented the network. Such difficulties, noted one national provider, are so great that the national providers are likely to add 28.8Kbps modems well before adding dial-up single-channel ISDN.

Performance Systems International Inc. (PSI) is a notable exception. PSI plans to offer 28.8Kbps and ISDN — for the same charges as 14.4Kbps. Faster speeds are not yet available in all of its local dialing areas, but the company is expanding its offerings on a weekly basis. In 1995, PSI plans to begin trials of 2-channel ISDN as well.

LOCAL PROVIDERS' BUM RAP. Regional and local ISPs still suffer under the conceptions of years past. Many local providers now have thousands of subscribers, and some are growing at the rate of more than 1,000 new accounts per month. The increased user base has fostered more professionalism and accountability, making the choice between a national and a regional ISP solely dependent on price, services, and availability in a given area. Some informal estimates of the number of ISP subscribers nationwide (including national ISPs) are as high as 400,000, including systems that may only offer E-mail.

It's still important to take precautions when signing up with a service. When an ISP goes out of business, the domain name becomes defunct and business cards with that address become useless. There's no Internet Postal Service to handle forwarding mail, although sympathetic ISPs may bridge the gap. Mail delays account for most problems that the average user faces day to day, and it may be useful to exchange mail with any provider that is under consideration to test the service.

In Seattle, a provider that began out of the owner's house and grew to have more than 2,000 subscribers at its peak, filed for Chapter 11 bankruptcy last summer, and finally closed down in early January. *The Seattle Times* noted that "numerous individual users said they never received bills."

Many users believe this is typical of local providers. In fact, in researching this article, no other instance of a large provider collapsing was encountered.

The big difference between regional and national providers is found in support: None of the regional providers surveyed offers 24-hour technical support; many of the national providers do. But, some regional providers are moving toward having around-the-clock, 7-days-per-week network operations centers; all regional providers have people on call 24-hour, 7-days-per-week for network outages and related emergencies.

COMPARING NATIONAL AND REGIONAL SERVICES

Service	Regional	National
Hourly fees	If metered, fees usually begin after first 30 hours.	Cap is generally 7 to 20 hours; only a few charge for every hour used.
Bandwidth to rest of Internet	Usually a T1 (1.544Mbps); sometimes as little as 56Kbps, other times as great as multiple T1 lines.	Often run their own national or international backbone with a direct feed into Network Access Points (NAPs), such as Metropolitan Area Ethernet-East in Washington, and CIX-West in San Jose, Calif., with a T3 (45Mbps) connection.
Local dial-up numbers	Regional providers offer some way to access without a long-distance call when you are out of the area; those that do not currently offer out-of-area dialing plan tie.	Offer numbers for many cities without an hourly surcharge for local POPs (although some do charge an hourly fee).
Preconfigured software	Only Pipeline offers a tailored package; others may offer or point users to commercial packages that include easy access to their services.	Most offer some kind of package or special interface for click-and-login first-time entry.
High-speed access	All offer 14.4Kbps; many offer banks of 28.8Kbps; several now offer single-channel ISDN.	9,600bps is top rate in many cities, especially those using public X.25 networks; 14.4Kbps is being de-ployed by all of them; 28.8Kbps still in the wings for most.

NATIONWIDE DIAL-UP IP SERVICE PROVIDERS

These companies offer local-area calling to points of presence (POPs) in many U.S. cities. Some offer Canadian and other international POPs at additional charges, which vary by city.*

Vendor	Type of connection and pricing	Local area dialing POPs (network)	800 service options	Software included or required	Phone support and hours	Description of service
IBM/ Advantis	PPP; setup fee:$35; monthly fees: $12.95 for 6 hours and $4 for additional hours, or $29.95 for 30 hours and $3 per hour for additional hours.	More than125 (IBM Global Network)	$6 per hour, plus regular hourly fees if minimum is exceeded.	OS/2 Warp Internet Access Kit	Toll-free 24 hours, 7 days a week.	Available currently just to OS/2 Warp users.
Concentric Research Corp.	Via special interface; no setup fee; monthly fee:~$30.	More than 100 (private network)	$5 per hour; $10 minimum per month.	The Internet Adaptor	Toll-free weekdays from 9 a.m. to 12 a.m., EST. Weekends as of January.	Requires use of software that simulates a true dial-up IP connection. Software included free. Rapidly expanding and has an international backbone.
CRL	SLIP or PPP; setup fee:$45; monthly fees:$19.50; $2 per hour for all hours.	More than 15 metro areas (private network)	None	None	415 number (San Francisco); weekdays, 9 a.m. to 5 p.m.	
MCI/ internetMCI	PPP; setup fee:$49.95 includes software;$18.95 without software; monthly fees:$19.95 for 7 hours; $3 per hour for additional hours.	More than 375 (MCI)	$7 per hour.	Packages from FTP Software and Netscape Communications.	24 hours, 7 days a week.	Sold as a prepackaged system for Windows, but may be used as a standard PPP account with other software. Monthly minimum may cover combination of local and toll-free access for as much as either 3 hours long- distance or 7 hours local.
Netcom On-Line Communication Services	Proprietary; setup fee:$25; monthly fees:$19.95 for 40 hours of prime time (weekdays from 9 a.m. to 12 a.m. local time) and unlimited other times; $2 per hour for excess prime hours.	More than 200 (private network)	None	Netcruiser (free from Netcom on request and sold via retail channels).	408 number (San Jose, Calif.); 24 hours, 7 days a week.	Proprietary IP interface; can't run standard TCP clients. Windows only.
Portal Information Network	SLIP or PPP; setup fee:$19.95; monthly fees: $19.95; $2.95 per hour to CPN numbers; $9.50 per hour (weekdays from 7 a.m. to 6 p.m.), or $2.50 per hour via SprintNet numbers.	More than 1,100 (CPN and SprintNet)	None	None	408 number (San Jose, Calif.); weekdays from 9 a.m. to 5 p.m., PST.	Uses CPN and SprintNet exclusively for access, which allows them to offer a wide service area.
PSI InterRamp	PPP; setup fee:.$29; monthly fees:$9 for 9 hours minimum or $29 for 29 hours; $2 per hour for hours beyond basic plan.	More than 75 (private network)	None	Various non-proprietary packages bundled with sign-up offers.	Toll-free, weekdays and Saturdays from 7 a.m. to 10 p.m., EST.	Pricing scheme is the same for single-channel ISDN and in many of the local dialing cities. First three months include unlimited use.

* Information on all charts is current as of January 1995.

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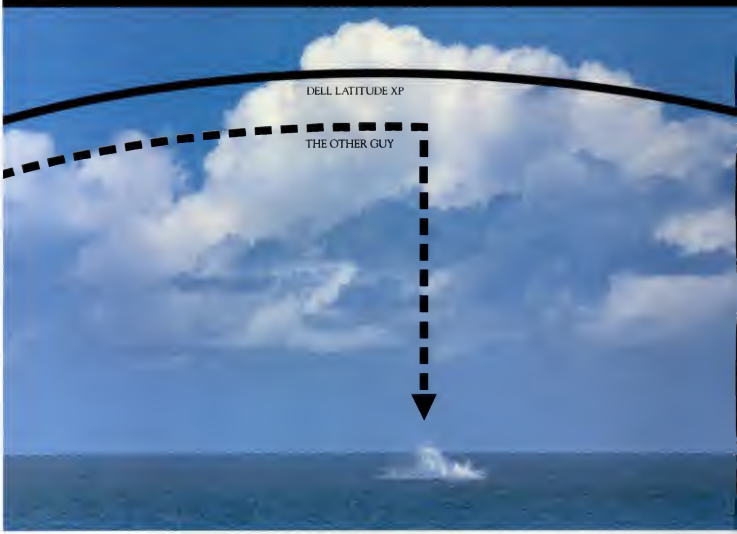

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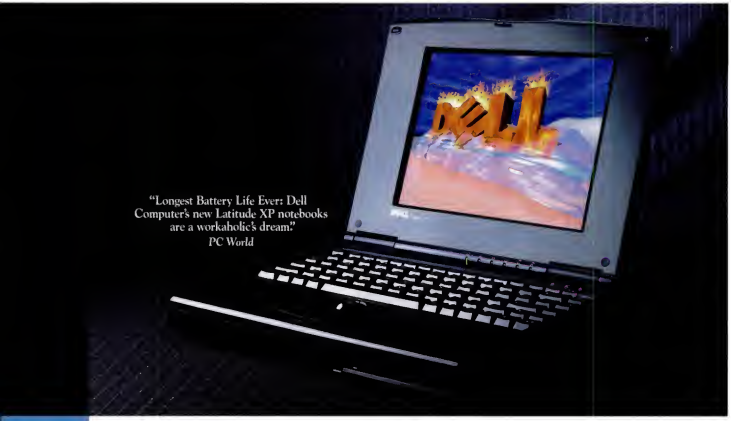

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In the past, it might have been impossible to get your local provider to investigate and solve a problem in the middle of the night, but that no longer appears to be a problem.

A critical concern for any business considering an ISP is how the service will recover from power and network failures. Power outages may plague both national and regional providers if redundant power supplies and backup systems are not in place. National providers typically have backup power for long outages, but they may lose power for short periods. For example, in late August 1994, Netcom was off-line for several hours after a freak loss of power. ScruzNet was down for an afternoon because of cut power lines.

If power loss is a concern, ask if the ISP has generated power for such emergencies. MCI says it is creating a "bullet-proof" power system for its internetMCI network. In the early days of Internet access, customers often complained that regional providers didn't provide enough phone lines. Users would try to connect and got only busy signals. Regional providers try to play a balancing game between peak accesses and busy signals; peak times for most providers is the end of the business day.

At Northwest Nexus, the company examines busy signals for peak hours and matches that information to customer complaints to determine when to add lines, said Ed Morin,

REGIONAL PROVIDERS

The Internet Service Providers in this chart are representative of their area. Most major cities have at least four full-fledged providers; some, such as Seattle and New York, have more than a dozen. Strangely enough, neither San Francisco nor Los Angeles has more than one provider offering services based in the city and focused on local efforts. Several national providers deploy from San Francisco Bay area headquarters and offer local services at the same prices as nationwide providers. Los Angeles has one major local provider, which competes heavily with an Arizona-based company that is blanketing the Southwest.

Many providers offer the not-quite-outdated UUCP (Unix-to-Unix CoPy) service for mail and news-feeds through an intermittent dial-up connection at little cost.

This service is most appropriate for businesses willing to devote a local server and phone line to dialing up a remote server from time to time; it allows mail receipt for an entire domain and can also allow local delivery of a newsfeed.

Some vendors include a shell account via Telnet as part of the charge of a PPP/SLIP account, while others charge a small fee. As many providers move away from dial-up shells charges vary, specific information was omitted; contact the ISP for more information.

ISP	Type of direct connection and pricing	Dial-up shell pricing	Storage available and monthly fee for excess	Subscriber-related details*	Software included	Nationwide access (surcharges vary)	Internet connectivity	Local phone support (non-network related)	Special features
Boston									
The Internet Access Co. (TIAC)	SLIP/PPP; setup fee: $20; monthly fees: $29 for 40 hours, or $49 for 300 hours.	Setup fee: $20; monthly fee: $19.	5Mb included; $1 per additional Mb.	More than 2,500 subscribers.	None	Expanding throughout New England through own POPs.	SprintLink	Weekdays from 9 a.m. to 9 p.m., weekends from 12 p.m. to 5 p.m.	
The World	The Internet Adaptor (TIA); no setup fee; monthly fees: $20 for 20 hours; additional time is $1 per hour; other plans available.	No setup fee; same pricing as direct connection scale.	5Mb included; $2 per additional Mb.	More than 12,000 subscribers; fiber-optic link to local phone company.	The Internet Adaptor	CompuServe Packet Network (CPN)	AlterNet (part of UUNET)	Weekdays from 8 a.m. to 12 a.m., weekends from 10 a.m. to 12 a.m.	
Chicago									
InterAccess	SLIP/PPP; no setup fee; monthly fees: $30, or $5 per month and $2.19 per hour.	No setup fee; monthly fee: $23.	5Mb included; $0.50 per additional Mb.	Orders more lines when over 75 percent of its phone banks are in constant use.	Macintosh and Windows shareware and TCP stacks are available.	CPN	Advanced Network and Services (ANS)	Weekdays from 8:30 a.m. to 12 a.m., Saturday from 12 p.m. to 6 p.m.	
MCSNet	SLIP/PPP; no setup fee; monthly fees: $30 (or $10 per month with $1 per hour for more than 10 hours).	No setup fee; monthly fee: $25 (or $10 per month for 15 hours, plus $1 per additional hour).	5Mb to 10Mb Included; depending on account (voluntary compliance).	103 modem lines in Chicago itself; 247 total in greater Chicago area.	None	In planning stages.	SprintLink and Net99	Weekdays from 9 a.m. to 9 p.m.	Multihomed Internet feed, including a high-speed link to the main Network Access Point at MAE-East.
New York									
Panix	SLIP/PPP; no setup fee; monthly fee: $35.	Setup fee: $55 (including setup for 14.4Kbps access); monthly fee: $19.	2Mb included; $1.50 per additional Mb	183 modem lines in New York.	None	Plans to expand to an X.25 network in 1995.	SprintLink	Weekdays from 9 a.m. to 5 p.m.	
Pipeline	Proprietary IP-like interface; no setup fee; monthly fees: $35 (also has two plans with fixed hours).	None	None	More than 1,000 new subscribers per month.	Internaut	SprintNet	ANS	Weekdays from 9 a.m. to 9 p.m., weekends from 12 p.m. to 6 p.m.	Pipeline's proprietary software only uses its integrated software (see story, page 58).
Silicon Valley									
Best Internet Communications	SLIP/PPP; setup fee: $30; monthly fees: $30.	Setup fee: $20; monthly fee: $20.	10Mb included; $0.50 per additional Mb.	120 lines; 60 added per month via a standing order.	None	No plans for service beyond area.	Net99 and CIX-West; MCI coming soon.	Daily from 10 a.m. to 10 p.m., some-times 2 a.m.	Extremely high modem-to-user ratio; highly focused on area market.
ScruzNet	SLIP/PPP; setup fee: $12.50; monthly fees: $25 for 100 hours, or $50 for unlimited hours.	None	None	"No busy signal" policy adds lines when monitoring or complaints show heavy traffic.	None	Regional POPs	The Little Garden, which is in turn connected to SprintLink.	Daily from 9 a.m. to 6 p.m., plus 24-hour pager number for technical support.	Using more than 100 hours converts your account to the $50-per-month option.
Seattle									
Northwest Nexus	SLIP/PPP; setup fee: $30; monthly fee: $30.	Setup fee: $30; monthly fee: $20.	5Mb included for most accounts (voluntary compliance).	Use busy signal studies cross-checked with user complaints to increase modem lines.	None	Planning stages	SprintLink; plans to add at least one more feed in near future.	Weekdays from 8 a.m. to 5 p.m.	Offers a permanent discount in conjunction with Hayden Books' *The Internet Starter Kit*.
Seanet	SLIP/PPP; no setup fee; monthly fees: $50 (or $20 for 10 hours, $2 each additional hour).	Offered only as an adjunct to PPP/SLIP, no dial-up.	5Mb included; $2 per additional Mb.	More than 90 modem lines.	Internet Tour Guide for Windows book and software.	Planning statewide expansion.	SprintLink	Weekdays from 8 a.m. to 8 p.m.	

*Some ISPs did not want to give out the number of modem lines or subscriber numbers, in which case we discuss their decisions for increasing lines. Discounts and extra service may vary.

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the head of Northwest Nexus.

All of the providers surveyed discussed the constant pressure and need to add modem lines. Best Internet Communications, in Mountain View, Calif., has a standing order with Pacific Bell to add 60 new lines per month, said Randy White, owner of Best.

ARE YOU A MEMBER? Last year, the Commercial Internet Exchange (CIX), a trade organization of commercial ISPs that agree to carry each other's traffic without settlement fees, said it would not continue routing packets among nonmember organizations across its router. It is unsettled whether CIX membership would become mandatory for such cooperation to continue.

CIX appears to have put the issue on a back burner, so CIX membership is not necessarily a prerequisite for choosing a provider. CIX is developing "a strategic plan to look at three business models of its membership," said Susan Fitzgerald, the executive director of CIX. The plan would also involve a new tiered membership fee structure.

Two new entrants into the national field, MCI and CompuServe Inc., joined CIX; some regional and national companies are members, but others are waiting to see if the y need to join CIX before committing.

These kinds of issues may make the decision to connect to the Internet seem mysterious. But an increasing number of resources, consultants, and providers is forcing the area to mature quickly. This article offers only a sampling of the access providers in various areas. For a complete list, try InterNIC's list of service providers at <http://www.internic.net/ internic/ provider.html>. For a list of providers and other resources, you can send E-mail to refdesk@is.internic. net.

With greater emphasis on reliability and up-time, regional providers are becoming a viable option to nationwide companies. Although existing on-line companies promise seamless Internet access, even some national providers have spotty records for delivering mail and maintaining gateways. Whichever service you choose, it pays to evaluate the company's financial, business, and technical underpinnings.

Glenn Fleishman is a principal with Point of Presence Co., an Internet consulting firm in Seattle.

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Bill Jones, MIS, age 38

Hair loss *occurs as users complain the system is costing them time, not saving it.*

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PROPRIETARY VS. OPEN INTERNET INTERFACES

Without some sort of script or detailed information for each package from the service provider, connecting to the Internet can become a trial-and-error process fraught with frustration. Documentation accompanying freeware and shareware is often poor or nonexistent.

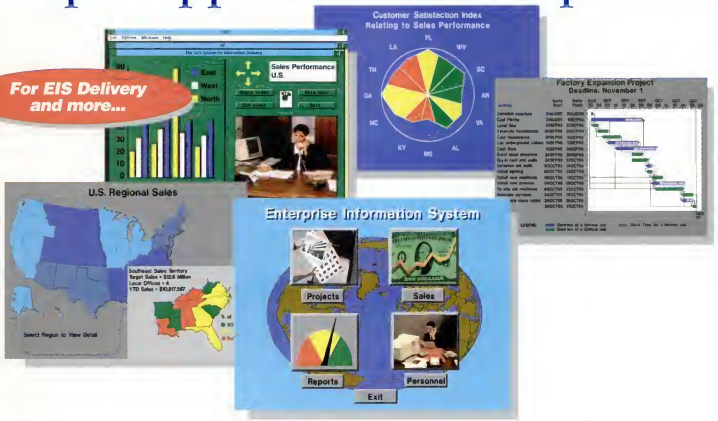
Some vendors are offering their own, proprietary front ends to simplify the process. Proprietary front ends tend to be integrated into a single application that uses a non-TCP approach to interact with the host system. On the other hand, an average Macintosh or Windows user with a standard dial-up IP account will have some kind of system-level TCP stack, and may have separate client packages for Gopher, World Wide Web, FTP, Archie, E-mail, news groups, Finger, and Talk. Some third parties, such as InterCon Systems Corp. and Net Manage Inc., sell integrated TCP clients that bring some of the advantages of both proprietary and TCP-based applications together, but usually at a high cost, ranging from $200 to $500.

IBM's OS/2 Warp Internet Access Kit also solves a couple of these problems at one step. The software is preloaded and preconfigured to connect to the Advantis network, but it's a matter of a few clicks to access IBM's easily scriptable dialog boxes for other Internet providers. Although IBM supplies its own versions of clients, it's also possible to use other TCP/IP packages, which is what keeps it from being proprietary in nature. OS/2 Warp automatically notifies the users of updated versions of the client software and will download the new versions and reconfigure the system with a few clicks and reboots. (See "Just like night and day: best and worst times in installing IBM software," Nov. 28, 1994, page 127.)

Alternatively, The Pipeline's Internaut graphical front end — which has been licensed for use and customization by a number of ISPs — offers all Internet client software in a single multitasking program.

James Gleick, founder of The Pipeline and author of *Genius: The Life and Science of Richard Feynman*, says that the Internaut software is "for people who want to make full use of the Internet and don't care to become full-time computer specialists to do it — and that certainly covers the vast majority of business users."

Client/Server Rapid Applications Development



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	Gateway 2000 Liberty DX4-100	Dell Latitude XP4100CX**	Compaq Elite 4/75CX*	Toshiba Portégé T3600CT*
Winstone 95	94	54	27	42
RAM	24MB	8MB	8MB	8MB
Screen Size	10.4"	9.5"	9.5"	8.5"
HDD Size	720MB	340MB	340MB	261MB
Weight	4.2 Lbs.	6.17 Lbs.	6.9 Lbs.	4.4 Lbs.
Price	$4799	$4799	$5999	$4099

**Compaq Elite and Toshiba Portégé configuration, pricing and Winstones from January 24, 1995,* PC Magazine. ***Dell Latitude configurations and pricing from February 1995,* Computer Shopper. *Latitude Winstone from January 24, 1995,* PC Magazine.

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MANAGER'S BOARD BULLETIN

FOR THE SECURITY MINDED. The National Institute of Standards and Technology (NIST), bad guys in the eyes of free-trade types during the escrow debate over the Clipper Chip in 1993 and 1994, has come out with a CD-ROM called the Tools and Techniquest Resource Library. The *Security Insider Report* newsletter says that this is a "must-have" for your library. The disk includes everything from anti-virus tools and network security techniques to comments about on-line ethics to papers on cryptography. Despite his wariness over NIST's ambiguous relationship with the National Security Agency, newsletter editor Winn Schwartau is high on the CD-ROM. Security zealots can even peruse anonymous underground cracker 'zines (renegade on-line magazines), such as *Surfpunk*. The NIST is at (301) 975-2821.

LIKE A ROCK. You might have read about a resurgence in American automotive sales during the last fiscal year, fueled in large part by quality improvement. Hoping to continue that trend through application of technology tools, General Motors Corp. is implementing Applix Inc.'s Applixware for its Quality Containment System (QCS). Developed at GM's Wilmington, Del., manufacturing plant, GM plans to implement the QCS at more than 30 plants worldwide by the second quarter. With easy viewing, graphs, and analysis of real-time and historical data, GM hopes the Applixware module will expedite the discovery and correction of defects during production.

CRITICS ON THE NET. A posting on the MIT client/server bulletin board cbtsrver@mitvma.bitnet recommends the *Macintosh Client/Server Database Development Summary*, by Liam Breck, for developers and managers involved in the evaluation, design, and construction of multiuser database systems. It covers more than 30 software tools for Macintosh and cross-platform development in three categories: client application development tools and development environments; data access layers and middleware for third- and fourth-generation languages as well as end-user applications; databases servers, SQL servers, and database replication. Breck works independently of any vendors, so the book is purely informational. Send E-mail to maccsdb@external.umass.edu.

THE SLEEPING CELLULAR GIANT. Calling China "potentially the world's largest carrier," analysts at BIS Strategic Decisions Inc., in Norwell, Mass., predict a 1,000 percent growth in the Chinese telecommunications market by 1998. "Teledensity is still under 1.5 percent and waiting lists continue to grow," asserts the author, Peter Batchelor. This, in conjunction with the government's permitting telecommunications competition, could mean such innovations as mobile updates from Taoists contemplating atop the country's remotest peaks.

Harness end-user enthusiasm

■ The savvy user can be your worst enemy or best resource

By Leo Spiegel

THANKS TO the computer industry's growing emphasis on the consumer market, IS managers are going to be faced with a user population that embraces technology with the momentum of a runaway train. Harnessing that enthusiasm and directing it in ways that match corporate goals will become increasingly challenging.

Today's users are exposed to technology at every turn, from cyberspace-mania to superstores. According to consumer buying reports, the number of sophisticated PCs equipped with modems and multimedia packages that were purchased during the last holiday season exceeded all expectations.

Most computer manufacturers are using mass-media marketing tactics to promote their latest offerings to home and office PC users.

As a result, business users are beginning to pepper IS management with a new level of interest and inquiry. Many times these users are going to want to implement their own solutions rather than the IS department's standard in a variety of areas from operating systems to word processors.

To avoid problems that could derail the corporate computing environment, IS managers need to strike a balance between encouraging user enthusiasm for new technologies and protecting the integrity of existing information systems.

For starters, IS managers should encourage their staff to think more like users and create opportunities to get closer to them.

Evaluate the new products that are being pushed at computer stores to understand the latest end-user "hot buttons."

Deploying IS personnel into business units is an excellent way to gain insight into user wants and needs. Most likely, the IS people distributed to different departments will find that users want office desktops with the same capabilities as their home machines, a problem IS never confronted when corporate computing occurred in a glass house on a 3090 mainframe. At the same time, users may come to appreciate that implementing a new technology such as an upgrade to Windows 95 is much more complex on a corporate network than a stand-alone home PC, due to additional drivers, network services, and more advanced applications.

Try educating users on the ramifications of integrating new technologies into mission-critical production environments. Once users learn about the many building blocks and multiple protocols on a typical corporate network, they'll gain greater understanding of IS strategies for implementing leading-edge — rather than bleeding-edge — technologies.

If these enthusiastic users accept collective responsibility for successful technology transitions, new projects may end up more successful. Creating user forums that invite participation in technology decisions is another effective way to address concerns and requirements in the early stages of an IS project.

One approach may be to allow a department or subset of users to pilot a beta system like Windows 95.

This pilot group will provide valuable feedback on how the enhancement or new product will change the way people work. Also, users will figure out that the probability of bugs and problems with existing systems increase exponentially with the addition of product features and complexity.

IS departments may also want to appoint a "user leader" — someone who will receive additional education and provide floor support to their peers during the project rollout phase. This local point person will encourage participation and ease the IS workload.

A new and improved partnership between IS and end-users will be the key to implementing new solutions in mature environments.

IS management should make user communication and education a major priority in 1995 and allocate both personnel and physical resources to maintain user enthusiasm while effectively managing system innovations.

Leo Spiegel is chief technology officer with LAN Systems, a nationwide systems integration firm.

Ways to promote IS/user partnerships

By establishing same programs, IS can create a cooperative relationship with end-users who might take matters into their own hands.

1. Encourage users' participation in pilot projects.
2. Communicate feedback and expectations to users.
3. Implement discussion databases or bulletin boards.
4. Conduct annual satisfaction surveys for feedback on technology improvements.
5. Define, educate, and enforce IS standards, including home-purchase incentives.
6. Modify training curriculum to handle multiple expertise levels and user biases.
7. Provide tools so users can manipulate data.
8. Plan dial-in and remote-computing needs.
9. Establish guidelines for corporate reimbursement of on-line service charges.

The ups and downs of SNA networks

The status of SNA networks is volatile according to a survey of Fortune 1000 companies.

Calendar

February

7-8 *Advanced Intelligent Network ComForum: The Next Generation Network Emerges, Phoenix.* Contact International Engineering Consortium, (312) 938-3500.

7-9 *Decnrum '95, DCE Industry Conference, La Jolla, Calif.* Contact Technology Solutions, (212) 696-2000, ext. 230.

13-15 *Metamorphasis West, Coronado, Calif.* Contact the Meta Group Inc., (203) 973-6700.

26-March 3 *Share Technology Conference, Las Angeles.* Contact Share, (312) 644-6610.

27 *Understanding and Exploiting Groupware and Lotus Notes, San Francisco.* Contact IDC, (508) 470-3880.

March

7-9 *Computer Telephony Expo '95, Dallas.* Contact Teleconnect, (800) Library or (212) 691-8215.

14-16 *New Media Expo, Las Angeles.* Contact The Interface Group, (617) 449-6600.

14-16 *Mactivity Conference: Macintosh Networking, Boston.* Contact Mactivity, (800) 798-2928.

20-24 *PCB Design Conference, Santa Clara, Calif.* Contact Miller Freeman Inc., (415) 905-4994.

26-29 *Infobase '95, Third Annual Infobase industry conference, San Diego.* Contact Uniglobe, (800) 625-6250.

April

3-6 *Application Development Conference and Expo, New York.* Contact Software Productivity Group, (508) 393-7100.

11-13 *Network World Unplugged, Wireless Computing Conference, New York.* Contact NWU, (800) 225-4698.

May

22-24 *Information Security Conference: Securing the Extended Enterprise, Rosemont, Ill.* Contact CMP, (800) 808-Expo.

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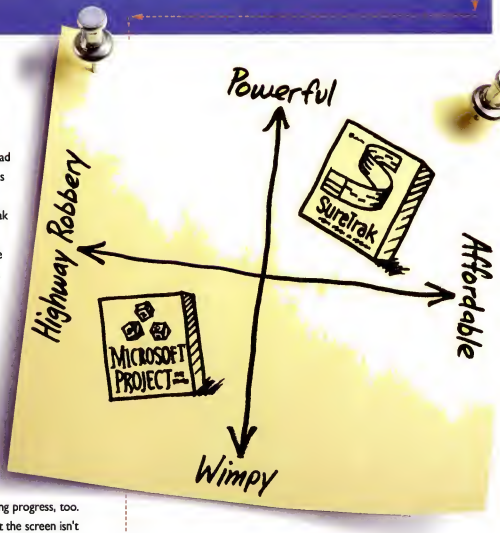

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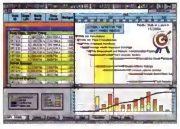

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Blue Cross climbs mountain of data with OLAP

■ Use of multidimensional database allows insurer better view of cost and performance information

By Alan Radding

CASE STUDY

BLUE CROSS/BLUE SHIELD of Maryland never intended to jump onto the on-line analytical processing (OLAP) bandwagon. A little more than two years ago, the Baltimore-based health-care organization thought its executive information system (EIS) was just what was needed for its top managers to quickly view its performance in such areas as costs and delivery of services.

But today, the EIS is long gone and the company is rapidly developing its OLAP capabilities. OLAP refers to processing data for decision support, rather than transactional purposes. It addresses business problems that typically involve multiple dimensions — for example, the sales of a particular product by region over a certain time period can be compared with sales in other regions and time periods.

Such multidimensional queries are difficult for conventional relational databases, which are inherently two-dimensional, composed of tables consisting of rows and columns. Users must write complex and cumbersome multistep questions to get answers to multidimensional queries.

OLAP, on the other hand, is much more suited to long complex queries that can slice, aggregate, and summarize huge volumes of production data in a variety of ways, thereby identifying key trends, isolating problems, and uncovering areas of opportunity.

RIGID DATA ACCESS. When Mark Max, director of financial systems, arrived at Blue Cross/Blue Shield (BC/BS) in July 1992, the organization was an unlikely candidate for a technology as advanced as OLAP.

"Our systems were patched together. There was very poor integration," Max recalls. "This was a traditional mainframe environment from the late 1970s. There was no way to access information except to write programs that created reports."

One information gathering system Max had inherited, along with a mandate to expand it, was a large, complex, recently completed EIS. Built on relational technology, the mainframe-based EIS had a graphical front end that produced very attractive screens. It was accessible from the organization's mix of DOS- and Windows-based PCs that were attached to a Novell NetWare 3.12 network.

But when Max looked under the hood of the EIS, he was discouraged by what he found.

"It was all hard wired. There was no way to change a screen or do anything different," he explains. "The data was there, but unless you were willing to write a new program, a 40- to 80-hour job, you couldn't get at it." Within a year, management pulled the plug on the EIS, which was proving too costly to maintain.

BC/BS managers and analysts were then forced to rely on such limited data analysis capabilities as canned reports, stand-alone spreadsheets, and whatever limited information could be culled from the general ledger residing on the mainframe.

"Managers were massaging the general ledger to come up with product-level profit-and-loss data, which they would input into spreadsheets," Max reports. The effort produced a summary total but did nothing to help with decision making, because there was no opportunity for real analysis.

"The pressure for better business-management information was growing at the same time that pressure for reform, restructuring, and cost control was hitting the health-care industry from all sides. Additionally, new competitors for health-care dollars were cropping up. And Blue Cross itself was developing new products, such as managed-care programs, in response to the changing business environment and competitive pressures.

ADOPTING OLAP *allowed Blue Cross/Blue Shield of Maryland to better examine its volumes of data and stay competitive in the health-care industry, says Mark Max, director of financial systems.*

SNEAKING IN A CHANGE. To address these pressures, Max got a hold of an evaluation copy of IRI Software's Express multidimensional database, which he had previously used when working as a financial systems consultant at Price Waterhouse.

With Express, he quickly built a prototype budget application, residing on a NetFrame Systems Inc. server, that allowed managers to really understand expenses for the first time.

"With the general ledger, you got stacks of hard copy but no analysis. With Express, we could find variances over time by cost center or product or any number of criteria," Max says. Suddenly, the company's budget analysis had an effective analysis tool, and managers were finally able to identify and respond to changes.

For example, it took Max 15 minutes to write an Express formula that would divide any budget item by the number of people (referred to as full-time equivalents, or FTEs) in the particular unit. Now managers could determine the average cost per FTE for any item and compare expenses of one unit against another on an apples-to-apples basis.

Training was another area where this new view of data was helpful. Managers looked at training costs and could quickly determine which departments were overspending on training.

"It would have required weeks of programming the old way, which meant we wouldn't do it," Max says.

Because of the multidimensional nature of Express, BC/BS could even view results by different organizational hierarchies, allowing managers to make year-to-year comparisons despite reorganizations and the relocations of various cost centers.

EFFECTS AND IMPROVEMENTS. The Express budgeting application has two groups of users, including 250 expense center managers, who use it for monthly expense reporting, and a small set of sophisticated financial analysts. This latter group was hungry for more than was offered by the application's simple model of time, budget expense, and cost center.

So Max built a more ambitious financial planning system using Express.

"This application allows us to do profit and loss planning by product line, market, and cost center over time," he explains.

Previously, financial analysts attempted this using an Excel spreadsheet, but it required dozens of worksheets for the different months and expense centers. Rollups and aggregations became a nightmare, and the integrity of results was questionable.

▶ **On-line analytical processing (OLAP): allows easier analysis of large volumes of data in a multidimensional environment.**

"We put it all in the multidimensional database, and it resolves all the different dimensions automatically," Max adds.

With the financial planning application, BC/BS managers are able to create planning scenarios based on enrollment for its various health-care plans by market. Using current prices, managers can project revenue while actuaries project various health-care cost trends. This allows managers to project profit and loss based on the expected shift from traditional health insurance indemnity products to such self-managed plans as the company's health maintenance organization.

Another new OLAP application under development performs cost-of-care analysis. Using data loaded into Express, BC/BS managers will be able to analyze hospital utilization: the average length of stay, the number of admissions, bed utilization, and other statistical measures of care delivery. This will allow the company to identify hospitals that perform below acceptable levels and focus on various cost components.

Despite these improvements, not everyone has taken to the new multidimensional OLAP approach.

"Realistically, about one-third of the managers don't have a clue about how to take advantage of the new applications and another third can struggle through," Max reports.

Many other users are simply unaware that they are using OLAP capabilities. To them, "[it] is not an analytical tool but simply a way of delivering information," Max concedes.

OLAP BY ACCIDENT. The corporate IS organization provides access to the data and manages the network but otherwise takes a hands-off approach to Express and OLAP.

"They don't want to touch it if it isn't relational," Max says.

Instead, BC/BS's move to OLAP has been led by Max's financial systems group, including application development in Express, which consists mainly of defining the data dimensions and specifying rules. Because BC/BS has fragmented transaction systems with a lot of missing data, Max's group's biggest effort involves manually getting the production data into shape — eliminating and reconciling redundant data — before it is loaded into the multidimensional database.

OLAP is now poised to be implemented in the company's health-care unit, as the financial systems group helps analysts in this department create their first Express applications. Despite never really planning to adopt OLAP, BC/BS is finding it a key method for providing its managers with the information needed to successfully compete and thrive in today's health-care environment.

Alan Radding is a Newton, Mass.-based free-lance writer.

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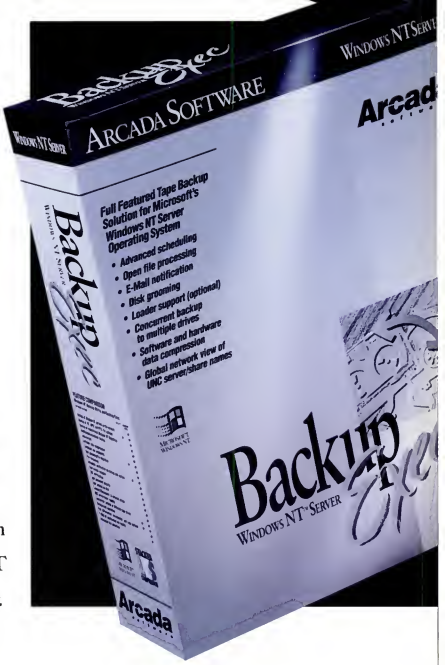

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ON SITE · DAVID STROM

ISDN isn't easy when the phone company thinks 'data' is a four-letter word

TO GET ISDN (that's Integrated Services Digital Network) running on your network, you will have to deal with your local phone company as a data customer. Making that relationship work may be a real challenge.

The scene is the Brigham and Women's Hospital, in Boston. When I visited John Lightfoot, the network manager for the hospital, he was looking for an ISDN connection between his new home and the hospital. John wanted to get a remote connection to his NetWare network over ISDN so he could continue to support his network during off-hours without having to come to the office. It seemed like a good idea.

But getting that connection took some time — six weeks to be exact.

Nynex is one of those phone companies that treats "data" like a forbidden four-letter word. The company has made some efforts to support data customers, such as offering a toll-free number for ordering ISDN service ([800] GET-ISDN), assuming service is available in your area. And in Boston, Nynex has a special hotline number (743-DATA) for its data customers. However, these efforts are just window dressing, and you'll see why.

As soon as I arrived at the hospital, we hit a few snags. First, we realized that we only had a single NT-1 device. The NT-1 is needed on both ends of the ISDN link — at John's home and at the hospital. We had to order a second one from the phone company or from a telephony supplier. These NT-1s are not cheap: They run up to $400. Several vendors have promised ISDN products with integrated NT-1 devices, but they weren't available when we did our tests in late 1994.

Next, we had to call Nynex for the "provisioning" information for both lines. Although provisioning conjures up all kinds of Wild West images for me, the phone company uses it to indicate how it's configured for a particular kind of ISDN application. Of course, there are many, many parameters and many combinations that constitute a single ISDN configuration. What this means is that you'll be lucky if you can find two ISDN applications that have the same provisioning setup, so you should know what you want to use your ISDN line for before you order it.

This is backwards. Imagine having to first buy your telephone, then read the fine print in the manual before ordering a phone line.

Intel Corp. — which has a remote access and videoconferencing product running on ISDN — has categorized applications into three color-coded groups: Red, Yellow, and Blue. Information on these applications is available by fax-back at (800) 525-3019. Ask for documents 8101, 8202, and 8109.

For most network applications, you want Code Blue, which means the two data channels of your ISDN line can carry either a single voice call or two data calls.

Unfortunately, Intel's color codes don't yet mean anything to Nynex, so we had to get the specific provisioning details behind Code Blue from Intel's fact sheets and tell the phone company exactly what we wanted.

When we called Nynex to get our provisioning information, we found out that we were trying to use a line in the hospital that had been disconnected. A single line remained active, and we had to track it down.

In the meantime, we got our first ISDN products set up. We started with John's short list of products from Intel, DigiBoard (a division of Digi International Inc.), and Gandalf Systems Corp.

DigiBoard and Intel both have internal ISDN adapters that work for the most part like network cards. DigiBoard's adapter comes with Network Driver Interface Specification and Open Data-Link Interface (ODI) network drivers for both the client and server side; Intel's board uses packet drivers and shims. Both products support NetWare 3.x networks. DigiBoard's adapter also supports Windows NT; Intel's supports Vines, LAN Manager, and IP networks as well.

PC Imac
(for Intel-based PCs only)
Price: $795
Write: DigiBoard, 6400 Flying Cloud Dr., Eden Prairie, MN 55344
Phone: (800) 344-4273 or (612) 943-9020
Fax: (612) 943-5398

Gandalf has an external box that must be attached to a computer via an Ethernet cable. Because it ships as a Token Ring shop, this was less attractive to John, and we decided not to test it. John liked the fact that DigiBoard's PC Imac had ODI drivers, so we decided to start there.

DigiBoard's server-side installation is a bit arcane. We decided to use a separate test server, which I provided. This server had a Token Ring card in it to connect to the hospital network and the DigiBoard ISDN card. You run a SETUP NetWare Loadable Module on the server to get the card installed. Unfortunately, this routine doesn't make any changes to your AUTOEXEC.NCF file on your server, which you will need to do manually if you want the DigiBoard drivers to load the next time you bring up your server. I also didn't like the fact that the installation copies files to your NetWare SYSTEM directory, rather than asking for a location of your own choosing.

Once the server software is installed, you have to go to a Windows workstation, load a TSR, run the configuration program from the network, and type in a variety of parameters. There is also a separate DOS configuration procedure for the client.

John also had a tough time with all this mystery. Part of our problem was that the manual takes a roundabout way of explaining what you need to do. Unfortunately, it is written from the perspective of someone who knows a lot about ISDN and very little about NetWare. In reality, John and I both know more about NetWare than ISDN. Intel's manual is a bit better at explaining things on the ISDN side, but it still has room for improvement.

John and I would rather see a greatly simplified installation process, where the card only needs to know what kind of switch the phone company is using. Think of plug and play for ISDN.

Stay tuned for more of our adventures.

David Strom is president of his own consulting firm in Port Washington, N.Y. Each week he writes about his experiences installing and testing network products at reader sites. If you have a product or a problem you would like David to tackle, send him E-mail at david@strom.com on the Internet.

LAN TALK · PAUL MERENBLOOM

If you're serious about backups, tape drive maintenance is a very big deal

THIS WEEK, in wrapping up the subject of backups, I want to touch on two specifics: tape drive maintenance and data restoration and validation. The first item, tape drive maintenance, is arguably one of the most important. Although we're all pretty diligent at copying data from disk to tape, it's pretty easy to forget to maintain the tape drive. Simply put, don't forget.

What's the big deal? Plenty. As you've probably experienced with a cassette tape, as magnetic tape is processed through the drive it maintains physical contact with the capstans, heads, and rollers.

It's not quite rocket science, but the result is the transfer of metal and plastic particles from the tape to the tape drive heads, capstans, and so on. Over time, a deposit builds and the transfer of data from the heads to the tape can become distorted. The good news is that there is an easy and inexpensive solution — head cleaners! (I told you this wasn't rocket science).

On average, drive manufacturers recommend you clean the heads of a tape drive after 6 to 8 hours of use. For some sites, 4 to 6 hours of use takes a month. Other sites (such as mine) run the drives for 8 hours each night.

You also want to be careful not to overclean the heads. Most head cleaners are abrasives that "scrub" the rollers, heads, and so on. After awhile, this can alter the surfaces.

This raises the second tape drive point. Get your drives under maintenance!

As mechanical devices, the tape drives are subject to head alignment problems, motor burnout, and mechanical failures. I learned this the hard way.

Maintenance on the drives usually runs a few hundred bucks, tops. And you can usually coerce the service provider to include regular preventative maintenance and factory refurbishment of the drives, complete with loaner equipment (before the drives fail in a production environment).

Next comes data restoration and validation. Although we all run backups religiously (well, we do, right?), not everyone has the opportunity to test the validity of the backup tapes. It's pretty easy (most of the time) to restore a few files or even an entire directory. But there are other considerations.

Usually simple restorations aren't necessary. But you should still know how to truly restore the server. For example, how long would it take you to configure the PC, install the SCSI system and tape drive (including drivers), load the necessary drivers, install and build the network operating software, connect to the network to the server, load the backup-and-restore software, shut down the server a few times (a routine part of server configuration and testing), and prepare to restore the tape?

Hmm. Probably more than 10 to 15 minutes, huh? Well, try doing this at 2 a.m. (unfortunately, I have) without any of the help lines open and you're in for a long, painful night.

Preparing the backups is useless unless you have restored data from them reliably and without problems. To make sure you can do this, I suggest you restore the entire contents of your tape to a parallel system and start testing. Rent (or purchase if you can) a spare PC to act as a backup file server. This should be almost identical to your production server, complete with tape drive, RAM, network interface cards, and so on.

Getting the files and directories back from tape is a pretty simple task. Making sure that the applications and data are all accessible with your permission tables (also called rights tables, security tables, or grants) intact and properly implemented is not so easy.

Even assuming that the tapes are in good shape, the restoration process can be tricky. Not all restore applications offer provisions for adding directories and rights by default. I've also run into situations where the data was restored and the permissions to the directories granted, but additional people got unintentional access.

Finally, a few words about desktop and laptop support. I'll save the details for another column, but remember many users store their important materials locally — either because they're on the road, don't like the LAN, or simply don't know how to use the server. Don't forget to have a backup solution (other than diskettes and the DOS Backup utility) for these folks — before they suffer a crash!

Paul Merenbloom is vice president, technology research at Piper Jaffray, in Minneapolis. Send comments to him via MCI Mail at PAULM; CompuServe 75663,2032; or the Internet at paulm@mcimail.com

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Meridian 800 with unretouched photo of active matrix display.

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MCD 2500 9501 56

Internet servers

New Internet support for IS

...means new options for companies needing to manage Internet traffic. We look at five products designed to make corporate adventures in Digital Wonderland easier on IS.

COMPARED

Hardware/software:

BBN Internet Server
BBN Internet Services Corp.

Sun Netra Internet Server
Sun Microsystems Computer Corp.

Software:

BSDI Internet Server 1.1
Berkeley Software Design Inc.

SCO Global Access 3.0
The Santa Cruz Operation Inc.

Slackware Professional Linux 2.1
Morse Telecommunication Inc.

The dramatic increase in corporate Internet traffic threatens to drive systems administrators and IS managers mad as hatters. That's why a handful of vendors have recently released Internet servers, a brand new class of products — consisting of software and sometimes hardware — aimed at companies that want to establish a presence on the Internet. Specifically configured to manage Internet traffic, they help systems administrators and IS managers handle the surreal problems that arise from doing business in cyberspace.

These products handle all of a business' Internet traffic: E-mail and news group administration; setting up and maintaining anonymous File Transfer Protocol (FTP) sites and World Wide Web (WWW) pages; managing Gopher client traffic and Domain Name Service (DNS); and handling the security issues that come with exposing one's corporate network to the world.

Some of these new Internet servers offer relief; others are like a bad trip beyond the cyberspace Looking Glass. Indeed, only one of the products we examined truly offered an easy-to-use, nearly plug-and-go solution to the problem of handling corporate Internet traffic. And one product — whose maker touts its Internet server software as The Answer for small and medium-size businesses — was so buggy, hard to use, and poorly documented that we wondered if the company had sent us the right product.

Welcome to the Wonderland of Internet servers, where a monitorless machine that we nicknamed Alice purred installation instructions in a smooth, feminine voice, words meant whatever vendor support lines said they meant, and a product from the realm of kindergartners upset the queens of the Unix networking realm.

HARDWARE/SOFTWARE COMBINATIONS. We scoured the realm looking for products that help companies cope with growing Internet traffic and discovered just five new or recently re-engineered offerings in this class, all of them Unix based. Two of them — BBN Internet Services Corp.'s BBN Internet Server and Sun Microsystems Computer Corp.'s highly touted Sun Netra Internet Server — are touted as nearly plug-and-play computers that come bundled with the software required to administer Internet traffic.

For companies that already have Sun workstations somewhere in their networks, the Netra is an attractive offering. This is especially true for companies that want to connect remote offices — which usually get little system administration help — to the Internet. Released in December, the pizza-box style machine arrives naked — sans monitor and keyboard — so it uses its audio capability to coo instructions in systems administrators' ears. Three Netra configurations are available; we tested the midlevel configuration. It's equipped with the So-

laris 2.4 operating system, an 85-MHz microSparc-II CPU, 32MB of RAM, and a 1.05-gigabyte Fast SCSI-2 disk.

The BBN Internet Server, also a brand-new release, consists of a preconfigured Pentium PC and administration software designed to run on Macintosh platforms. You also get a VGA monitor, a built-in tape backup drive, a power conditioner, and a keyboard. In part because of its Macintosh interface, the product is the most user-friendly of those we tested. Different software modules are available for the BBN; you choose the ones you need, and the software is installed on the machine before it leaves the company. (Indeed, you can also buy a service contract from BBN, and the company will even administer your machine on its premises. We tested the do-it-yourself plan.) Based on an earlier product for the K-12 education market, the BBN is extremely easy to install and use, and it has proved that if you make a product simple enough for kindergartners and secure enough to deter high school hackers, it'll be great for corporate America.

SOFTWARE SOLUTIONS. If you already have lots of PCs and are interested in turning them into Internet servers, consider one of the three software products we tested. Based on established Unix operating systems, they now sport new Internet capabilities and administration tools to appeal to companies that are less Unix-centric. One of these PC products, Morse Telecommunication Inc.'s Slackware Professional Linux 2.1, is a supported version of the freeware Linux OS.

Many companies sell versions of Linux; these vendors compete on the basis of price, documentation, and support. Retailing for just $64.95, Slackware is inexpensive and has the added advantage that it's compatible with DOS and Windows. Morse has also included a variety of Internet utilities and has bundled the CD-ROM with documentation and support, which should please those too faint of heart to customize the versions of Linux floating around the Internet.

We also examined two software products from companies long associated with Unix: the BSDI Internet Server 1.1, which combines Berkeley Software Design Inc.'s BSD/OS, Version 1.1, with extra utilities for Internet capabilities; and The Santa Cruz Operation Inc.'s SCO Global Access 3.0, which is essentially a combination of SCO Open Desktop/SCO Open Server 3.0 and the Global Access supplemental component, which adds news group and Web page services. A special 16-license package for larger businesses is also available.

BSDI 1.1 sells for about $62 per user in 16-user license packs ($545 for a single copy) and was the clear winner in ease of installation and administration among the software products we tested.

In contrast, SCO is the reigning PC Unix vendor. That's why we were stunned when SCO Global Access did so poorly on our tests. Its unfriendly interface included little in the way of help for inexperienced systems administrators, the documentation was regularly wrong, and we frequently experienced unexplained strange system behavior and crashes. Considering that this product is aimed squarely at small and midsize businesses, we couldn't understand how SCO could unleash such a product on its customers; even now, 20 or 30 technical support calls later, we still don't.

We would have liked to review Microsoft NT Server as an Internet gateway, but the new Microsoft Corp. software that manages DNS — the capability to recognize machine names and addresses — is not expected to be released until later this quarter.

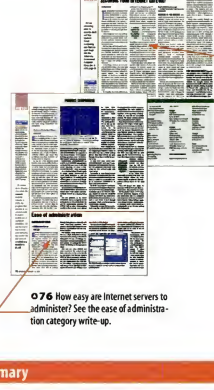
WHAT DO IS MANAGERS WANT? We surveyed 1,000 of our readers about how their companies used (or wanted to use) the Internet and what they'd like to see in Internet products. Some wanted to be able to make documents, such as marketing literature, documentation, and software, available to customers and collaborators over the Internet. Many also mentioned they wanted a machine that would keep company personnel connected to their colleagues at other Internet sites via E-mail and news groups.

Some IS managers, though, said they wanted products to handle the administration tasks associated with E-mail and news groups, DNS, anonymous FTP sites, WWW pages, and Gopher client traffic. That's why we emphasized how easy it was to set up and maintain these services. (See "How we tested," page 71). And interestingly, the key difference among these products was precisely how easy they were to use. Some nearly reduced us to tears; others made the most basic tasks seem almost fun.

Our survey respondents also mentioned that security was a big issue. That's why we obtained both security-testing software and the services of Unix security expert Rik Farrow to determine exactly how and where each product was vulnerable. In many cases, we even recommended fixes for the security breaches we found, and we report these in our security evaluation. Finally, Farrow explains network protection products (see story, page 84).

And so, with apologies to Lewis Carroll for what we're about to do to his tale of the Walrus and the Carpenter, the time has come, we say, to talk of many things: of Unix, mail, and FTP; of security and PINGs.

In this section



84 For a discussion of Internet firewall products, see story on securing an Internet gateway.

70 Report Card
71 How we tested
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076 How easy are Internet servers to administer? See the ease of administration category write-up.

Summary

▸ Continued from page 7

that help IS departments more easily respond to the growing corporate need for Internet administration. We evaluated how well these two Unix machines managed the server side of corporate Internet traffic: Domain Name Service; E-mail; anonymous File Transfer Protocol; and World Wide Web page setup, maintenance, and security. They meet the growing Internet needs of companies that have inexperienced, overburdened, or Unix-phobic systems administrators, or branch offices that need to get by with very little IS help.

BBN Internet Services Corp.'s **BBN Internet Server**, a Pentium-based Unix machine with a Macintosh front end, was an easy winner. Although you can't quite take it out of the box, turn it on, and have it start managing every aspect of your Internet traffic (unless you have BBN do this for you), this server comes closest to plug and go. Its FrontDoor interface made most setup and administration tasks easy and fast. The downside: it's expensive and requires at least one Macintosh client to use its front end.

Sun Microsystems Computer Corp.'s **Sun Netra Internet Server** offers much of the same functionality as the BBN at a slightly lower cost. But it doesn't include a monitor, terminal, or keyboard; its software doesn't do as good a job of isolating users from Unix. You also have to edit a few text files during configuration and maintenance.

The Score: Hardware/software

7.6 BBN Internet Server

6.3 Sun Netra Internet Server

The Score: Software

7.0 BSDI Internet Server 1.1

5.9 Slackware Professional Linux 2.1

3.5 SCO Global Access 3.0

We reviewed three software packages ranging in price from about $65 to about $550. They can be installed on existing PCs, but all three were more difficult to configure and maintain than the hardware packages.

Of the three software-based products, Berkeley Software Design Inc.'s **BSDI Internet Server 1.1** was the clear winner. It was the easiest of the three to set up and administer, and it sells for just $995 for a 16-user license, which makes it extremely affordable for small and medium-size businesses. Unfortunately, you still need to know your way around Unix to perform some administration tasks.

In the middle is Morse Telecommunication Inc.'s **Slackware Professional Linux 2.1**, which has freeware origins. Several vendors are now selling Linux, competing mostly on price, documentation, and support. Slackware makes an acceptable Internet server at the unbeatable price of $64.95 for an unlimited number of users. It also coexists well with DOS and Windows. But Morse's support and documentation were strictly no frills.

The Santa Cruz Operation Inc.'s **SCO Global Access 3.0** did the worst in our testing, which astonished us because the OS on which it's based has probably sold more copies than any other PC Unix. It may appeal to people whose idea of a good time on a Saturday night is editing configuration files and creating new shell scripts that mask the product's flaws. It sometimes crashed and couldn't be restarted without reloading the entire OS. On good days, it was hard to use; on bad days, it made us need therapy. Most appalling, the documentation that came with the product was routinely wrong, and SCO kept having to fax us the real directions. Like a high-tech Humpty Dumpty, SCO apparently believes that the words in its manuals mean whatever its faxes say they mean.

RELATED ARTICLE

Sept. 12, 1994, page 68
Surfing with TCP/IP
While this week's product comparison focuses on Internet servers for IS and systems administrators, our previous comparison of TCP/IP products focused on the clients that end-users can use to cruise the Internet.

CONTRIBUTORS

Reviewed and tested by **Steve Irvin**
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Test plan by **Greg Johnson**

Security story by **Rik Farrow**

Edited by **Lisa Stapleton**
Senior Editor and Enterprise Team Leader

▸ *Picking the right Internet service provider can be tough. For help making the right choice, see this week's Enterprise Computing feature, 'Looking for the right Internet connection,' page 51.*

Report Card

Internet servers

GUIDE

- Rating
- Score in points
- See this page for detailed report information

InfoWorld reviews only finished, production versions of products; never beta-test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting of each criterion by its rating, where: Excellent = 1.0 - Outstanding in all areas. Very Good = 0.75 - Meets all essential criteria and offers significant advantages. Good = 0.625 - Meets essential criteria and includes some special features. Satisfactory = 0.5 - Meets essential criteria. Poor = 0.25 - Falls short in essential areas. Unacceptable or N/A = 0.0 - Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to *InfoWorld* readers involved in purchasing and using that product category. You can customize the Report Card to your company's needs by using your own weightings to calculate the final score.

The Test Center Hot Pick is *InfoWorld*'s new award for outstanding products we have evaluated in scored stand-alone reviews or product comparisons. To receive the Test Center Hot Pick seal, a product has to offer what *InfoWorld* deems to be a standout feature or technology that is unusually valuable or revolutionary compared to competitors. The product must also score at least satisfactory in all Report Card categories and receive a final score of 7.0 or more

	Weighting	Hardware/software BBN Internet Server BBN Internet Services Corp. Cambridge, Mass. (617) 873-2000	 Sun Netra Internet Server Sun Microsystems Computer Corp. Mountain View, Calif. (800) 786-0785, ext. 110	Software BSDI Internet Server 1.1 Berkeley Software Design Inc. Colorado Springs, Colo. (800) 800-4BSD, (719) 593-9445
Performance				
Setup	200	*Excellent* ❶200.00 ⚐72 BBN's Macintosh-based FrontDoor interface was a pleasure to use once we got the proper password. At first, we had a few minor problems with E-mail and Domain Name Service (DNS), but these were quickly resolved and from there on setup was smooth sailing.	*Good* ❶125.00 ⚐72 Most features were easy to configure. Installing the OS was easy, and the iadmin program allows easy setup of hosts, user accounts, Internet Protocol (IP) addresses, and network services. But we had to manually edit files to set up DNS and had to copy and run a script from the on-line documentation to set up anonymous File Transfer Protocol (FTP).	*Very Good* ❶150.00 ⚐72 Many aspects of setup were easy. We had a few problems at first — most of them traceable to documentation — while we were setting up the operating system, but all other parts of setup were pretty simple, except for FTP. To set up this last service, we had to manually edit several Unix files.
Ease of administration	250	*Very Good* ❶187.50 ⚐76 The clean FrontDoor interface made administration of E-mail, World Wide Web (WWW), and the OS as easy as setup. BBN doesn't use the same interface to let systems administrators make changes to DNS or anonymous FTP, so here you'll have to use Unix commands and edit some files. (You can let BBN Internet Services handle these for you; we tested our ability to do this ourselves.)	*Very Good* ❶187.50 ⚐77 iadmin is a good interface that makes adding, modifying, and deleting hosts and users pretty easy. The recovery procedure also makes it easy to restore mail settings in case of a crash or corruption. There's no Web server component, but SLIP and PPP administration capabilities are included.	*Good* ❶156.25 ⚐77 The product's administration files and utilities were generally easy to use, especially those for maintaining a WWW server and E-mail accounts. Unfortunately, the BSD/OS Internet Gateway does not include a GUI or unified administration program for all services.
Security	150	*Excellent* ❶150.00 ⚐78 We found only one vulnerability — an old version of the Site Exec utility — in BBN's security, and it is easily fixed by getting a newer copy of the utility or disabling Site Exec.	*Good* ❶93.75 ⚐78 We found several potentially serious but fixable security problems. The admind command was running in insecure mode and the mail daemon was running on the system, both potentially bad security holes. The Finger and rusers commands were also on the system.	*Very Good* ❶112.50 ⚐78 We only found one minor security problem: The Finger command was installed on the machine.
Support and pricing				
Documentation	100	*Good* ❶62.50 ⚐78 The FrontDoor interface is very nicely documented, but, in keeping with the company's approach of shielding users from Unix, the documentation doesn't include any manuals for the Unix component of the product.	*Satisfactory* ❶50.00 ⚐78 The Netra's documentation is straightforward and simple, and the manual is generally accurate and lucid. But sections on key topics, such as setting up DNS, are conspicuously absent.	*Poor* ❶25.00 ⚐78 There's only one manual, and it was missing pages. Also, it has no index, and important topics are left out.
Support policies	50	*Satisfactory* ❶25.00 BBN doesn't offer free support, but the mandatory first-year software maintenance contract includes unlimited toll-free support and free upgrades, fax, and E-mail support. Help for nonconnectivity-related problems is available weekdays from 9 a.m. to 8 p.m. Eastern time; connectivity issues are addressed 24 hours, seven days a week. You can buy optional hardware support. A next-day replacement service is available for $690 to $770 a year.	*Very Good* ❶37.50 Sun provides 90 days of unlimited, toll-free telephone support weekdays from 8 a.m. to 8 p.m., although the company encourages users to buy both the system and its support through authorized Sun resellers. If you choose this option, the support you get may vary from one reseller to the next, so you need to carefully check the details of any such plan. If you insist on continuing support from Sun, the company also offers a variety of support plans.	*Very Good* ❶37.50 The BSDI Internet Server comes with a 60-day, money-back guarantee and 60 days of unlimited toll-free telephone support weekdays from 9 a.m. to 5 p.m. Mountain time. For $295, customers can also purchase additional support that includes upgrades and support via U.S. mail, E-mail, and fax. Berkeley Software Design offers special support plans for larger, multiple-license accounts, but we did not evaluate these.
Technical support	100	*Good* ❶62.50 We couldn't place anonymous appeals for technical support because BBN staffers regularly check log files and monitor the status of machines in the field, so we can't award a score any higher than good. But we had no problems reaching BBN's technical support staff; engineers answered our questions promptly and knowledgeably. We even received a call when BBN realized that our server was not responding over the Internet (we shut it down periodically during testing).	*Satisfactory* ❶50.00 Sun's technical support was maddeningly tough to track down. When we did reach them, they provided us with knowledgeable answers, but it took several days, which for most companies wanting to do business over the Internet is way too long.	*Very Good* ❶75.00 Berkeley Software Design's support works on a call-back basis. In all cases, a technician called us back within 1 hour of our initial call. Nearly all of our problems were resolved during the first callback. BSDI's support people were patient with our calls and offered extra tips for system performance.
Price	150	*Satisfactory* ❶75.00 A fully configured system costs between $9,895 and $10,955; we evaluated the $9,895 model. A mandatory first-year maintenance contract adds another $1,450, putting BBN out of range for some small businesses. But compare that with the cost of dedicating a PC and a systems administrator to manage Internet traffic.	*Good* ❶93.75 We reviewed the Netra i5, priced at $8,499. (The most expensive configuration, the t20, sells for $13,199, while the least expensive starts at $6,149.) Twelve months of support for the model we tested adds another $480. This is a bit steep, but not so drastically out of line with either similar Unix machines or high-end PCs that it's outrageous.	*Excellent* ❶150.00 Prices start at $545 for a single license, and you can get a 16-user license for $995, which works out to about $62 per user. Of course, you'll need a PC on which to install the software, but additional capabilities, such as SLIP and PPP, are a nice bonus, leading us to conclude that $545 is a very decent price, and $62 is even better.
Final score		**7.6**	**6.3**	**7.0**

SCO Global Access 3.0 The Santa Cruz Operation Inc. Santa Cruz, Calif. (800) 726-8649, (408) 425-7222	Slackware Professional Linux 2.1 Morse Telecommunication Inc. Long Beach N.Y. (800) 60-MORSE, (516) 889-8500
Performance	
Poor ● $0.00 ☐ 74 Everything about this product's installation was poor: Setup was tedious and required manually editing almost all of the files that needed to be created or changed; the documentation was wrong in numerous places; and the system was buggy, crashing and requiring reinstallation from the OS up on several occasions.	*Satisfactory* ● 100.00 ☐ 76 Setting up the Linux operating system was frustrating, in part because of poor documentation. In particular, we had trouble setting up an X Windows interface. But other parts of the installation, such as E-mail setup, went fairly smoothly once we edited the configuration files by hand.
Poor ● 62.50 ☐ 77 This product didn't get any better after installation. Strange system lockups and consistent problems didn't go away, even though we reinstalled the system several times from the ground up. (See all of the complaints in our installation write-up.) Off with its miserable little head.	*Satisfactory* ● 125.00 ☐ 77 The product provides little help in changing your ONS or FTP setup. Administering sendmail, however, is a fairly easy process once you've suffered through editing the ONS files.
Good ● 93.75 ☐ 78 We found many moderately serious security violations in SCO Global Access — FTP-owned directories, daemons running without authentication, and the rusers and Finger commands on the system — but they're all easily fixed.	*Good* ● 93.75 ☐ 78 We found a moderate number of security problems, one of which — an unsecured root account — was serious. Directories were, in some cases, owned by FTP, and the Finger utility was also present on the system. All of these problems are easily remedied.
Support and pricing	
Unacceptable ● 0.00 ☐ 78 SCO's documentation caused us to waste hours of our time and made using the product almost impossible. Our stack of faxed corrections shows that SCO knows its manuals are inadequate and still hasn't updated them. SCO should have to pay for our therapy.	*Satisfactory* ● 50.00 ☐ 80 The generic manual that ships with Slackware is mostly accurate, but it doesn't contain anything more than the standard public-domain Linux documentation. Important topics, such as anonymous FTP configuration, for example, are conspicuously left out.
Satisfactory ● 25.00 SCO has a variety of support plans and services from which to choose, but none are provided free with SCO Global Access. We evaluated the SCO Premier service plan. For $4,000, you get 20 service requests. If your experience is anything like ours, you'll need them all. (Packages are also available for 40, 60, and 80 requests.)	*Satisfactory* ● 25.00 Morse provides 30 days of free (but not toll-free) support. E-mail support is also available during this initial period. Support hours are weekdays from 9 a.m. to 5 p.m Eastern time. After that, you're on your own.
Poor ● 25.00 The technicians we spoke to seemed quite versed in Unix issues and were consistent at setting up and making return calls to answer our questions. The engineers we spoke to were patient and guided us through the complex issues of ONS and E-mail setup. But many aspects of SCO's technical support were slipshod, such as taking a week to send us new Ethernet card drivers by overnight mail. We believe these flaws will make SCO a poor choice for businesses contemplating putting critical parts of their businesses on Internet servers.	*Satisfactory* ● 50.00 We experienced some difficulty getting through to Morse's technical support staff, both because of the time difference and the fact that no answering service or voice mail was available to take our message; we just had to keep calling back. The staff seemed to know the product pretty well, but nobody offered to lead us through processes such as X Windows video card configuration, which was as hard as learning Latin.
Good ● 93.75 The SCO package does include some extras. A Web server daemon is included and installed by default, and a news reader is also included. A 16-user license for companies not already using an SCO operating system costs $2,590. If you already have the SCO operating system, you can get the Global Access updates for $195.	*Excellent* ● 150.00 For $64.95, you get an unrestricted, multiuser license. You can't beat the price, although, as with the other software-only products, you'll have to factor in the price of a PC or compatible. But if you already have one, it's a great deal.
3.5	5.9

HOW WE TESTED

TESTING THESE Internet servers was a long, curious journey, as Alice might have said, full of surprising outcomes. Here's how we did it.

First, we surveyed a sample of our readers to see what intrigued them most about using the Internet at their companies.

The results indicated that our readers were most interested in using the Internet to help their companies handle E-mail. They also wanted to support anonymous File Transfer Protocol (FTP), which is a good way to help make marketing, sales, and technical information available to potential customers and other interested people and organizations who want to download it. (And it's anonymous in the sense that people cruising the 'net can retrieve or upload files without having a predefined user name and log-on code.)

Many readers expressed an interest in Gopher, a utility that helps users locate interesting information available on machines accessible to the Internet. People viewing information on the Internet can find out where information is located by using Gopher and then downloading this information using FTP. But if a company wants to make information available via Gopher, its systems administrators must be able to set up a machine to handle that capability. And of course, employees of many major companies themselves want to be able to use Gopher to search the Internet for information relevant to their own work, so the Gopher capability needs to work both ways.

Our surveys also showed that the growth of Mosaic, an interface for viewing on-line documents, has been so phenomenal that many of our respondents would like to publish documents that can be viewed using Mosaic. Many businesses want to be able to make information — about their companies, products, and personnel — viewable by anyone with a Mosaic reader. That's why we decided to also evaluate these products based on how easy they made it for systems administrators to set up and modify World Wide Web (WWW) pages (which can be viewed by Mosaic).

Finally, because we're interested in putting our server on the Internet, we needed to establish Domain Name Service (DNS), the component that associates Internet addresses, such as asylum.eteam.com, with their corresponding Internet Protocol (IP) addresses. (Ours is 192.216.48.5.) And to make DNS work correctly, we also needed to set up TCP/IP network services for the Internet side of the gateway as well as for the 10Base-T Ethernet LAN.

As in the real world, our first task was to establish a connection with an Internet service provider. Fortunately, *InfoWorld* already has full Internet service via a 56Kb line connected to NearNet. The first step was to register our domain name with the InterNIC organization — which handles Internet registry — by completing an electronic registration form. In about 10 days, we received confirmation from the InterNIC that our new domain, eteam.com, and it's corresponding address had been officially registered. We kept our test segment physically separate from the rest of *InfoWorld* LAN segments for security reasons.

Because each product would have the same domain name and address, we set up and tested each product separately on our network, one after the other. For the BBN Internet Server and Sun Netra Internet Server — the two hardware/software combinations we tested — this just meant installing them on our network and then unplugging them when we were done. We installed the software products on Hewlett-Packard Co. 486/66N desktop systems with 16MB of RAM. We also set up two other HP 486/66N test clients running Microsoft Corp. Windows 3.1 and a TCP/IP stack to test Internet access through each gateway. These clients were attached locally via Ethernet and 10Base-T.

We didn't perform speed tests on these Internet server products. We felt that benchmark testing would be inappropriate for two reasons. First, the erratic pace and performance of the Internet itself prohibits the use of any but the most general of benchmarks. Second, the readers we surveyed seemed most concerned with security, setup, and administration issues. Equally important are the number and types of services included, such as the capability to set up a WWW server or set up and administer anonymous FTP.

We settled upon seven evaluation criteria for our comparison: setup, ease of administration, security, documentation, support policies, technical support, and price.

SETUP

We looked at how easy it was to set up DNS, E-mail, anonymous FTP service, and WWW pages. If any of these services was missing or didn't work, the product received a score of poor in the corresponding subcategory. (We also looked at setup of the underlying OS and hardware where applicable, as well as Gopher capability.)

The products earned a satisfactory setup score for a service if the service was included and could at least be configured manually, even if that meant editing files related to each service. Products that made setup easier by using lots of prompts, menuing systems, or GUIs gained a full word score (for example, going from Good to Very Good). Vendors that did a good job at implementing these aids could gain

▸ How we tested (page 80)

▸ *Setting up Web pages using Slackware is a largely undocumented process. For help, you can try accessing the following source: http://akebono.stanford.edu/yahoo.*

Setup

MS. NETRA IN INTERNETLAND

She's very talkative

Because the headless Netra has no monitor or keyboard, it has to do a lot of configuration tasks itself, even if technicians eventually connect it to a monitor or PC. That's why it uses its audio ports to talk systems administrators through the early part of installation. The effect is surreal.

▶ *'Attention,' purred the Netra, 'there is no diskette in the drive ... insert a configuration diskette in the server's drive before you turn on the system.'*

'That voice!' commented a technician, shaking his head. 'Yeah,' another whispered. 'Kind of makes you want to configure her again, doesn't it?'

HARDWARE/SOFTWARE

■ BBN Internet Server

EXCELLENT

Using BBN isn't quite as easy as plugging in the unit and turning on the power switch, but its turnkey approach comes amazingly close.

BBN handles some configuration details before the company sends you the machine. But the company needs data about your system first.

The BBN Internet Server is easy to set up. That's because most of the setup is either done on the machine before you get it or is accomplished by using its FrontDoor interface.

So we went to work, defining the host and router Internet Protocol (IP) addresses for our domain, as well as the secondary Domain Name Service (DNS) data, netmask information, E-mail addresses for the test clients, and the name of our account administrator. Then we ran all of this information to BBN Internet Services, which configured the Internet Server at its facility before shipping the unit to us. (Many of BBN's Internet software modules are sold separately; BBN installs the ones users choose before it sends them the machine. We got the software necessary to handle mail, news groups, File Transfer Protocol [FTP], and World Wide Web [WWW] service.)

When we got the machine, we set it up in our enterprise lab and proceeded to install FrontDoor, the administration front end, on our Macintosh Centris 650. (At present, FrontDoor is only available on Macintosh computers. A company representative said that a Windows release is planned for the first half of this year.)

So far, so good. But the first time we tried to access the gateway via the Macintosh, we couldn't log in. BBN had assigned us an account name and password, but it was documented incorrectly on an index card shipped with the computer.

Then we tried getting access to the server from the BBN Pentium-based host itself, which runs Unix. That's when we discovered a second snag. Nowhere could we find the root password, which we needed for the Unix OS on the server.

BBN's technical support personnel then informed us that they didn't have the root password handy, nor did they know anything about our account problem, but they'd call us back as soon as they knew something. They were true to their word, and they called us back directly with the missing password, which was very cryptic and a hassle to type in.

We went back to FrontDoor, toyed around with variations on the administrator account name, and came up with two that seemed to work with the given password.

We could then access the server from the Centris. We began shooting test messages into the ether, connecting to the server from our client PC using anonymous FTP, and publishing a Home page for the WWW server. In this way, we were able to verify that, with one small exception, all of our required services worked.

That exception was E-mail delivery. The culprit was an incorrect entry for our PC client in BBN's named.hosts file. The host was defined as user "PC," and the router wasn't recognized when we sent mail to the actual user, named "mercury."

We changed the name in the named.hosts file and everything worked just fine. (This step wasn't documented.) Then we verified DNS functionality by using PING and running the nslookup command against remote sites.

The Web server setup could have been easier in only one respect. When we accessed the Server with Mosaic, there was no default Web page. Some of the other products, such as BSDI and SCO Global Access, include a sample Home page, which contains hyperlinks to some remote Internet sites and lets new administrators view the Home page and edit it. (Gopher and news group administration were already configured.)

▶ **If your company is very security conscious, remove the Finger and rusers commands during setup.**

But these flaws are minor; we can hardly imagine an easier and more effective approach to Internet gateway setup. BBN is incredibly close to being completely plug and play. If money were no object (you'd need around $11,000, and you'd have to buy a Macintosh, too, if you didn't already have one), this would be the product we'd all own.

■ Sun Netra Internet Server

VERY GOOD

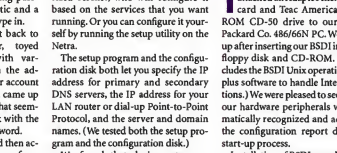
The Netra comes with the Solaris 2.4 operating system already installed. You have several options for configuring the Netra. You can use a configuration disk supplied by an authorized reseller or your service provider. You can purchase the Netra from an authorized reseller, who will configure it based on the services that you want running. Or you can configure it yourself by running the setup utility on the Netra.

The setup program and the configuration disk both let you specify the IP address for primary and secondary DNS servers, the IP address for your LAN router or dial-up Point-to-Point Protocol, and the server and domain names. (We tested both the setup program and the configuration disk.)

We found that during setup, we weren't able to use the configuration programs to specify the Netra as a primary DNS server. We were, however, able to accomplish the same effect by manually editing files.

(A Sun representative said that a primary DNS configuration utility will be present in a future release.)

Automatic configuration of anonymous FTP was also unavailable, but the FTP electronic manual page (which is called the "man page" in Unix) contained a script file that automatically set up anonymous FTP when we ran it. This process was easy; we just copied the script from the man page to a file, made it executable, and ran it. Sun said it will add anonymous FTP setup in its next release.



BSDI Internet Server has facilities for setting up a Domain Name Service server and provides lots of online help. However, its interface leaves a lot to be desired.

The Netra may present a migration problem for some users. The machine uses a SPARC processor, which means that software written for Intel-based machines won't run on the Netra. Sun has a software package that lets you run Windows applications on the Netra, but it's an extra-cost option.

The Netra E-mail package is based on the sendmail program, which is configured by editing a text file. Sendmail is powerful, but it's also notoriously difficult to configure correctly. For example, if you have clients being served locally by your BSD/OS gateway and you want them to receive mail directly, you must answer "yes" to "Does this machine accept SMTP (email) directly?" If you choose the default of "no," mail will stop at the gateway and not be delivered to clients; you won't be warned of this.

We also found that for the WWW server to run properly, we had to install perl — a scripting language that's popular with Unix types —from the OS CD-ROM. From there, though, the process was painless. The system prompted us for our company name, phone numbers, company contact names, and E-mail addresses. Then it automatically created a simple Home page that can be read at start-up if you should somehow corrupt the settings while the machine is running.

SOFTWARE

■ BSDI Internet Server 1.1

GOOD

To install the software solutions, we attached an Adaptec Inc. 1542 SCSI card and Teac America Inc. CD-ROM CD-50 drive to our Hewlett-Packard Co. 486/66N PC. We powered up after inserting our BSDI installation floppy disk and CD-ROM. (BSDI includes the BSDI Unix operating system, plus software to handle Internet functions.) We were pleased to see that all of our hardware peripherals were automatically recognized and accepted in the configuration report during the start-up process.

Installation of BSDI was a breeze, but we ran into a few documentation problems along the way. Several pages were missing from our manual, which wasn't obvious at first, so we skipped crucial steps, thinking we were following the directions. We were stunned by a rash of error messages, which prompted us to call technical support. The support technician knew about the missing pages and the commands we had omitted. We got the missing pages via fax and tried again.

This time, we easily brought up the OS. Our next step was to install the EZ-CONFIG software and reboot the system. (You can make changes later by running the config_network, config_dns, config_www and adduser programs.)

As long as you carefully answer all of the questions asked during the interactive setup process, sendmail will be configured correctly. For example, if you have clients being served locally by your BSD/OS gateway and you want them to receive mail directly, you must answer "yes" to "Does this machine accept SMTP (email) directly?" If you choose the default of "no," mail will stop at the gateway and not be delivered to clients; you won't be warned of this.

We also found that for the WWW server to run properly, we had to install perl — a scripting language that's popular with Unix types —from the OS CD-ROM. From there, though, the process was painless. The system prompted us for our company name, phone numbers, company contact names, and E-mail addresses. Then it automatically created a simple Home

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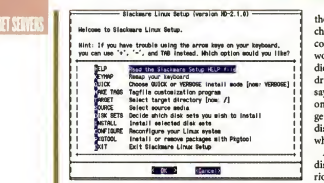
PRODUCT COMPARISON



Morse Telecommunication's Slackware Professional Linux 2.1 lets you configure the system to your liking.

page, which also contained many default hypertext links to interesting sites on the 'net.

A major negative: There has to be a better way to set up anonymous FTP on BSDI's operating system. We had to set it up manually by editing several Unix files.

■ SCO Global Access 3.0

POOR

Installation started out well, which should have immediately made us suspicious. We supplied the IP address, host name, and domain information, and it looked as if the software would be installed without a hitch. But we had a nagging problem getting drivers for our EtherLink III network adapter, which is not supported out of the box despite its popularity. SCO technical support told us to download the appropriate drivers from their FTP site. Normally, that would have been easy. But of course, we did not yet have a machine to receive the files because the gateway machine couldn't yet connect to the network because we didn't have network drivers. (Can you say catch-22?) Our only option was to get the drivers on disk from SCO, which took a week.

After we got the disk, things got curioser and curioser. With driver disk in hand, we soon discovered that SCO's custom utility could not recognize the floppy disk. Another call to technical support revealed that we had to manually edit a file each time we started the program to set the default media type to "F" for floppy because we had installed the product from CD-ROM. Also, we had to comment out an entry referring to the network drivers shipped on the CD-ROM disk, so as not to confound the utility's feeble intelligence.

The product recovered from abnormal shutdown conditions only with great difficulty, occasionally requiring lengthy technical support help, or worse, reinstallation of the entire operating system. Also, when we issued the correct system shutdown command from within the Open Desktop (SCO's operating environment) shell, logging back in to the server was sometimes difficult. Worse, we often saw the server lock up when running Unix commands from an Open Desktop Unix window.

DNS administration was equally problematic. SCO provides no setup utility to make the process less tedious; we had to edit the five files necessary to configure DNS using a standard Unix editor, vi, which should be prohibited by the Eighth Amendment's rule against cruel and unusual punishment.

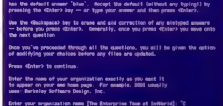
For E-mail administration, SCO's Open Desktop Environment can be configured to use either sendmail or MMDF (Multichannel Memorandum Distribution Facility) as the Simple Mail Transfer Protocol (SMTP) mail transport agent. SCO recommends using MMDF and claims in the documentation that it is the easier mail transfer agent to set up and maintain. But it's a toss-up between MMDF and sendmail, which is a tragic commentary on SCO's mail capabilities; configuring sendmail has kept entire armies of systems administrators gainfully employed.

Watch out for one particularly wretched flaw in SCO's E-mail: The configuration utility makes suppositions about your network that may not be true. If this is the case, you have no choice but to run the utility, then use the manual, then call technical support to guide you in modifying the appropriate configuration files.

Installation problems were frequently exacerbated by lousy documentation. For example, the System Administration manual provided what appeared to be a straightforward example of commands necessary to create an anonymous FTP account for remote server access. We had to create the FTP user account and assign its default directory before turning to the documented procedure. But when we followed the outlined steps to manually create various directories and assign permissions and ownership to the FTP account, our remote FTP clients could access the server anonymously, but we couldn't see the files placed in directories once we navigated down the directory structure. Nor could we navigate back up to the root directory we defined for the account.

A call to technical support revealed that the setup procedure in the manual was wrong. Once the proper procedure was faxed to us, we were able to successfully configure and use the service from that point.

Despite all the misinformation in the



The BSDI Internet Server has a pretty nifty facility for setting up Web pages. You answer a few easy questions, such as "What's your favorite color?", and a draft page, which you can later edit, is created for you.

IN SEARCH OF GOOD DNS ADVICE

A number of reference manuals are available for educating yourself in Domain Name Service (DNS), which is the core of a Unix-based gateway setup. One such book, O'Reilly & Associates' *DNS and BIND*, is recognized as one of the best. And don't be too concerned if configuration examples in such books use different file names than those referred to in your Unix product. With the exception of named.boot, DNS doesn't care how you name these files, as long as they contain cross-reference entries to each other. Syntax, now that's another story ...

A survival guide to Unix and the Internet

Daemon: A background Unix process, usually for handling low-level operating system tasks.

DNS: On TCP/IP networks, the Domain Name Service provides Internet Protocol (IP) address translation for a given computer's domain name. For instance, DNS would associate a computer name such as joe.acme.com with the machine's actual numeric IP address, which always takes the format xxx.xxx.xxx.xxx. This allows users to refer to the domain name that is more common and easier to remember when interacting with a remote computer.

Domain: A group of machines on a network that shares something in common, such as the function they serve, the organizational type they belong to, or their location. Top-level domains include .COM for commercial organizations, .EDU for educational institutions, .GOV for government organizations, and numerous others specifying foreign countries.

FTP: File Transfer Protocol provides a low-overhead means of transferring files from one system to another on a TCP/IP network. Because TCP/IP has been ported to virtually all operating systems running on most hardware platforms, FTP is a convenient means of shuttling files in heterogeneous network environments. Anonymous FTP doesn't require a user to have an established log-in ID or password.

Gateway: For this comparison, we define a gateway as a computer that moves data from one physical network to another.

Gopher: A distributed information service developed at the University of Minnesota that collects information from the Internet. It is both a protocol and a program that searches and retrieves documents from remote sites.

Host: Any computer directly connected to the network. A host is not the same as a server.

HTTP: Hypertext Transfer Protocol is the transport protocol used when transmitting hypertext documents across the Internet.

Internet: In case you've been marooned on an island the past couple of years, the Internet is an interconnected matrix of networks that spans the globe and uses IP to allow computers to share services and communicate.

IP: Internet Protocol.

IP address: On a TCP/IP network, an assigned number that uniquely identifies each computer. The network and the computer are both represented in the sequence of numbers.

Mosaic: A freeware World Wide Web browser that uses a graphical user interface to access and view on-line hypertext documents with embedded graphics and, occasionally, sound and animation. Hyperlinks in the documents can be clicked to instantly access related information or sites.

Name server: A computer running DNS that manages Internet domain names and numeric addresses, resolving the names into addresses.

PPP/SLIP: Point-to-Point Protocol/Serial Line Internet Protocol provides a method for transmitting data packets over serial lines.

Router: A self-contained unit or computer that makes decisions about which path Internet traffic will take to reach its destination. A router can also filter network packets in order to restrict traffic in or out of its local network.

sendmail: The most commonly used message transfer agent for Unix systems. Provides back-end message routing and handling for Simple Mail Transfer Protocol-based E-mail communications.

Server: A host computer that processes, routes, and stores data on behalf of the clients directly attached to it. It performs such services as resource allocation and sharing, file printing, and file downloading.

TCP/IP: Transmission Control Protocol/Internet Protocol is an established protocol that provides platform-independent support for network communications, such as routing traffic across networks.

World Wide Web: A matrix of computer sites running HTTP, allowing users to explore network resources, usually graphically, from multiple entry points. WWW provides hypertext links to data sites on the Internet, and you can use these to provide corporate information to new customers.

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PRODUCT COMPARISON

SECURITY AUDITING SOFTWARE

What's available?
There are many tools to help you audit the security of Unix systems. COPS is the best known, and does a good job of individual Unix systems. You can get it from ftp.cert.org:pubs/tools/cops. Another program, Tiger, originated at Texas A&M University and includes checks oriented to specific operating systems. You can get it at net.tamu.edu:/pub/security/TAMU. To check for altered files, such as a hacker-modified log-in program, you can use Tripwire, which can be obtained by FTP at ftp.cs.purdue.edu:/pub/spaf/COAST/Tripwire.

manuals and odd system behavior, we finally managed to get Global Access up and running. But if SCO continues to claim that SCO Global Access is an out-of-the-box solution for huge enterprises and small entrepreneurs alike, the most charitable assumption we can make is that the company's marketeers have been eating Wonderland-style mushrooms.

■ Slackware Professional Linux 2.1

SATISFACTORY

Given the history of Linux as a free-ware operating system, we expected a no-frills attitude toward operating system and gateway configuration issues, and this is one of the few expectations we had of Slackware that proved true. Slackware's modest list price covers the cost of packaging media, documentation, and a couple of added installation utilities that make Unix installation easier than it could be. After that, you're on your own.

We ran the setup program, which loaded a menu-driven utility that let us select the desired components from the CD-ROM media. We were faced with various choices for installation, from full hard-disk installation to a partial installation with links to the CD-ROM. The former improves performance by using up hard disk space; the latter saves disk space, runs more slowly, and lets you boot applications and utilities directly from the CD. We selected a partial installation and were presented with a list of components and services to copy to the hard disk. (We chose the ones we knew we'd need for our testing and left most of the other options on the CD-ROMs.)

The rest of the installation procedure was automatic. We waited while Linux decompressed files and set up the directory structure. We really liked the way Linux color-coded files, directories, compressed files, and file links, a convention that makes picking out files and directories from a list much easier. Also, some DOS commands are supported. It was nice, for instance, to see a directory listing displayed when we accidentally typed dir at the command prompt.

Because many Unix aficionados are used to an X Windows environment, we decided that most users would want to take advantage of Linux's X Windows GUI interface, which is included.

So we tried installing X Free86, a public domain graphic environment for Unix, which presented us with our biggest hurdle yet. We couldn't get the GUI to appear on-screen at all. We discovered that we would need to configure our monitor and video chip set using a configuration utility.

This presented a linear interface with lists of video products and monitors to choose from. These entries were automatically entered into a configuration file.

Our test platform, an HP Vectra 486DX2/66, had an integrated S3 805 video chip set on the motherboard. We ran the configuration program. We couldn't find an entry corresponding exactly to what we had, so we selected the other video boards based on the 805. One by one, the selections didn't work.

Frustrated, we tried using generic SuperVGA video parameters in 640 by 480 mode. Voila! We rebooted for the umpteenth time and were face to face with XFree86, which we hated — the interface was awful. Having gotten this far, we decided to install the included Open Windows component on top of XFree86, since we're familiar with the Solaris/Open Windows version of that GUI. This was a much simpler process than what we had just gone through. It was time to tackle the gateway issues.

As with SCO's Open Server, many DNS configuration tasks must be performed manually from a Unix text editor. Our experience with Linux DNS setup was very similar to that with Open Server.

Essentially, we were forced to make the changes to configuration files without the aid of interactive tools or interfaces. As a result, we encountered a couple of self-inflicted problems due to typos and syntax.

But by far the product's worst fault is its documentation's failure to help users set up DNS. Even SCO attempts to provide some help in the form of a reference chapter on DNS, but Slackware provides nothing on the subject in its public domain documentation. As a result, we were forced to read through man (manual) pages, which provided guidelines but no specific examples.

Fortunately, we were able to use standard setup files created with some of the other products we tested. Because DNS configuration files must conform to certain syntax and structural standards regardless of the operating system involved, we were able to successfully copy the files before starting the daemon responsible for DNS support.

Expecting newcomers to Unix to understand DNS setup is a lot like expecting an unarmed young Alice to win a duel with the Red Queen; but the makers of this product assume you know your stuff and provide no tutorials or help in their package. This is particularly damning when you consider that any 5-year-old with a PC can get Linux off the Internet, and the main value that vendors of Linux add is good documentation and support.

E-mail setup was just OK. The mail transfer agent Linux uses for shuttling SMTP mail around the Internet is sendmail. With some help from the man pages and the Unix text editor vi, we were able to figure out how to configure sendmail correctly. Configuring sendmail involved two basic steps. The first was defining the test user addresses and canonical names in an aliases file, which sendmail refers to when routing mail. The second involved editing the sendmail.config file to point to a file containing domain aliases for the mail servers.

Once the changes were made, we were able to route back and forth between our PC, Mac, and Unix test hosts.

But the product excels at FTP setup. We were pleasantly surprised to find that anonymous FTP was configured and operational after our installation was completed. Without lifting a finger, we were able to access a public directory structure on the server, which was automatically set up. We were smiling like Cheshire cats.

```
Don't forget to increment the serial number in named.ora

$INCLUDE named.ora

localhost       IN  A       127.0.0.1
                IN  MX  50  sayiun.stoun.com.
mercury         IN          A       192.216.46.101
pluto           IN          A       192.216.46.105
ns1.barmnet.net IN          A       131.119.245.5
ns2.barmnet.net IN          A       131.119.246.6
sayiun          IN          A       192.216.46.9
                IN          MX      10      sayiun.stoun.com.
stoun.com.      IN          MX      sayiun.stoun.com.

www             IN          A       192.216.46.9
ftp             IN          A       192.216.46.9
news            IN          A       192.216.46.9
www             IN          CNAME   sayiun.stoun.com.
ftp             IN          CNAME   sayiun.stoun.com.
news            IN          CNAME   sayiun.stoun.com.
```

SCO Global Access 3.0's Domain Name Service administration is pretty confusing, and help such as this isn't very useful for beginners. "Don't forget to include the serial number in named.soa," indeed! What language is that, anyway?

> *To receive more information about the Internet Security Scanner 2.1 (ISS), the program we used to test security, send E-mail to iss@iss.net or call (800) PROBE62. ISS can be used to test security over networks; the cost for the first network on which you install it is $1,195.*

> Always back up your sample Web pages and configurations before changing them.

Ease of administration

HARDWARE/SOFTWARE

■ BBN Internet Server

VERY GOOD

Gateway administrators can manage all user accounts on the BBN machine, create mailing lists, establish and maintain internal news groups (such as a group for all of the people in a company working on a particular project) and publish World Wide Web (WWW) and Gopher documents.

FrontDoor, the administration front end, has a GUI interface that lets you add, delete, and modify user accounts from a Macintosh client, which is much easier on systems administrators than using Unix.

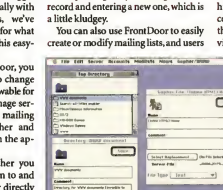
Indeed, the simplicity of the Macintosh interface is never more evident than when it is masking the complexities of an operating system such as Unix. Since we've had to struggle through these processes manually with some Unix-based products, we've gained a greater appreciation for what BBN has accomplished with this easy-to-use interface.

For example, using FrontDoor, you can use a single dialog box to change the services and privileges allowable for each person. You can also manage services, such as accounts and mailing lists, news groups, or Gopher and WWW servers, by clicking on the appropriate boxes.

Also, you can select whether you want a user to be able to log in to and have write access to the server directly via anonymous File Transfer Protocol (FTP) or Telnet. All selected privileges are instantly reflected in the appropriate Unix configuration files when you save the settings.

A minor nit: You can only change a user's privileges by deleting the old record and entering a new one, which is a little kludgey.

You can also use FrontDoor to easily create or modify mailing lists, and users can be added in typical Mac fashion by highlighting their names in the All Accounts window and dragging them into the Mailing List window. To view the members of a mailing list, you double-click on the entry in the All Mailing Lists window.



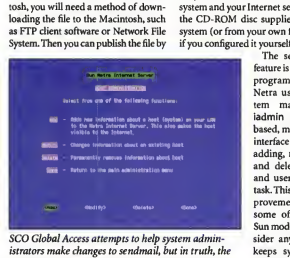
The BBN FrontDoor interface makes administration as easy as setup for services such as mail and host administration.

FrontDoor's interface groups the Web and Gopher services into the same menu item, offering the same configuration tools and options for both. The WWW module is quite friendly. Tailoring the Web and Gopher servers entails using the New Directory window to create directories to which

files can be posted. Directories can easily be viewed or modified once they're created.

To create a file item for Gopher, you must start with the file on the Macintosh desktop or on the hard drive.

If the file is not native to the Macintosh, you will need a method of downloading the file to the Macintosh, such as FTP client software or Network File System. Then you can publish the file by



SCO Global Access attempts to help system administrators make changes to sendmail, but in truth, the Multichannel Memorandum Distribution Facility interface isn't even easier to use than editing files using vi.

dragging it to the New Gopher File window.

When you publish a document, it's copied to the corresponding directory on BBN, where it waits to be accessed by a Web browser.

Links to local or remote Web pages can be defined in the folders.

The tools for publishing both Gopher and WWW entries are the same, but you can keep Web pages from being viewed by Gopher clients by adding them to the special WWW folder, which is invisible to the Gopher server.

Hypertext Markup Language (HTML) pages cannot be created, viewed, or edited from within FrontDoor.

However, two of the services, anonymous FTP and Domain Name Service, (DNS) are not within the scope of FrontDoor (although BBN can handle these, too, if you purchase the extra software and services).

Therefore, administrators needing to modify the existing DNS or anonymous FTP installations won't escape facing BSD Unix directly.

You make changes in Internet Server's BSD Unix just as you would in BSDI. For DNS, you will need to manually edit one or more of the five configuration files related to DNS.

Of course, if you're a particularly security-conscious business, you may actually want to set up the system so that FrontDoor doesn't handle these. That's also an option for the BBN Internet Server. This would prevent anyone walking by the Macintosh from messing around with the system when the systems administrator is away from her desk.

Unfortunately, DNS administration isn't within the scope of FrontDoor (although BBN can handle it for you if you wish).

Sun Netra Internet Server

VERY GOOD

The Netra has two features that increase its ease of administration. First, if part of the OS gets corrupted, you can restore both the operating system and your Internet settings from the CD-ROM disc supplied with the system (or from your own floppy disk, if you configured it yourself).

The second nice feature is `iadmin`, the program that the Netra uses for system maintenance. `iadmin` is a text-based, menu-driven interface that makes adding, modifying, and deleting hosts and users a simple task. This is a big improvement over some of the older Sun models. We consider any tool that keeps systems administrators from using the Unix vi text editor just to add a host a big plus.

One negative: The Netra doesn't come with a Web server component, so the product doesn't get the associated scoring bonus. It does, however, come with SLIP and Point-to-Point Protocol capabilities, for which it gets a bonus.

SOFTWARE

BSDI Internet Server 1.1

GOOD

Using the BSDI Internet Server 1.1, we tested mail to and from local clients and remote sites on the Internet, and it worked fine. We enjoyed viewing our simple Home page and decided to dress it up a bit. The ASCII text editor was easy to use, but we discovered that if you edit your HTML files and then run `config_www` again, the configuration program causes your changes to be wiped out.

This is true of all configuration settings, not just those relating to WWW service. Your best bet is to run `config_www` initially and then make all subsequent changes only with a text editor. This is true of the other BSD/OS administrative and configuration programs as well.

Adding local clients to the gateway's network is easily accomplished using the `config_dns` program. These clients will then be automatically set up to receive and send mail through the gateway. The `adduser` utility made adding user accounts easy.

Unfortunately, BSDI does not include a GUI or unified administration program to administer all of the services we tested, so we can't give it a great score. But we have to admit that its configuration programs are generally easy to use, and this fact compensates somewhat for the lack of such a cohesive interface.

SCO Global Access 3.0

POOR

Throughout testing, flaky lockups and frequent misbehaviors were consistent problems that did not go away, despite repeated installations. These problems didn't just affect setup; they undermined our ability to use the tools included for administering the gateway.

Global Access provides no helpful utilities to aid in modifying necessary DNS files, so any modifications you need to make are made more tedious by the necessity of manually editing files. An interactive utility would spare users this tedium.

For example, if you need to create new mail groups for users or reroute a user's mail to another location, you'll need to edit the `mmdftailor` file, which SCO's deliver daemon checks each time it starts. (Oh no, not the `mmdftailor` file!)

How bad was editing the file? It was actually easier for us to go into the `/etc` directory and add users by editing the `passwd` file manually with a text editor or by rerunning the configuration utility. And if you had to configure the Multichannel Memorandum Distribution Facility manually because of the way your network is designed, future modifications must be also configured manually.

The Sun Netra Internet Server comes with several nice utilities to help you with host administration.

SCO's Open Desktop Server provides two ways of managing user accounts. The menu-based program that SCO provides to perform most of these tasks is `sysadmsh`; some administration tasks can also be carried out individually from the Unix command prompt

The Netra's network services administration menu lets you view the status of Internet-related capabilities such as mail, File Transfer Protocol, and Telnet.

(using `chmod`, `chown`, `chgrp`, for example). For E-mail configuration, you must use `mkdev` or `mmdf` or manually edit files. Although `sysadmsh` is an interactive utility, we can't figure out why SCO provides a GUI desktop environment (Motif) but does not provide one for `sysadmsh`.

In fact, the utility's interface was confounding. More than once we hit the Escape key to back out of changes we made in fields related to adding user accounts, only to find that we'd aborted the entire process and lost all our entries. The only way we found to save a screenful of information was to hit Enter on the last field. This brought up a dialog box giving us the choice of saving the entry. A final oversight: SCO provides no utilities to make the process of changing your Web setup easier.

Slackware Professional Linux 2.1

SATISFACTORY

Administering Slackware is a mixed bag. The downside is that many network changes in your DNS setup must be manually applied, because Slackware's utilities don't handle all types of DNS changes. That means you have to use vi, which is a great way to ruin anyone's day.

If you are only interested in adding or deleting users, `sendmail` isn't difficult to change. In fact, in these scenarios, it's only necessary to change user entries in the alias file accordingly. Some tasks, such as redirecting mail to different machines or moving your mail server to another machine, require that you manually edit the `sendmail` configuration files, which can be tedious. A good book on `sendmail` configuration is a must; beyond some general guidelines in the man pages (electronic manual pages), you won't find this information included with Slackware. The product also has a WWW server, but it's totally undocumented.

FTP administration is handled by manually issuing the appropriate commands from the Unix prompt (`mkdir`, `chown`, `chmod`, and so on), which is clearly less user-friendly than a GUI or menu-driven program.

To make changes to Web pages, you'll have to edit one or more of three `httpd` files. No interface or documentation is provided to help you.

HOW OPEN IS A SERVER WHEN IT'S LOCKED?

Here's how to avoid finding out

The Open Server portion of SCO Global Access was quite flaky on our HP Vectra 486 DX2/66 test platform, locking up frequently. If this even happens to you when you're administering Global Access, here's something that worked for us: Try performing all administrative tasks that don't require you to log in in maintenance mode (such as `sysadmsh` tasks and configuration file editing) from a separate tty session. By default, Open Server's GUI environment runs in tty2. By selecting <CTRL+ALT+F1> or <ALT+F3-F10>, you can access a separate command line session from which to do your work. While we still experienced random crashes, we found this averted the near certainty of server lock-up when performing the tasks in a Unix shell under SCO's Open Server environment.

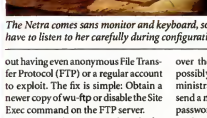
Security

HARDWARE/SOFTWARE

BBN Internet Server

EXCELLENT

The one vulnerability we found in the BBN Internet Server's security is easily fixed. Internet Security Scanner (ISS) found an old version of the Site Exec utility, which in turn is part of a Unix process called the wu-ftp daemon. Older versions permitted hackers to get remote root access without having even anonymous File Transfer Protocol (FTP) or a regular account to exploit. The fix is simple: Obtain a newer copy of wu-ftp or disable the Site Exec command on the FTP server.



The Netra comes sans monitor and keyboard, so you'll have to listen to her carefully during configuration.

For some IS managers, though, the idea that BBN has access to their corporate gateway machine is a little creepy.

If it bothers you to have BBN looking out for you this way — and it's all part of the mandatory one-year service agreement — you might want to choose another solution. We don't think this is a problem for most people. Indeed, many IS managers find such support reassuring. BBN also includes an S-key encryption scheme, which helps keep passwords and other critical information secret.

Sun Netra Internet Server

GOOD

Several potentially serious security problems existed in the Netra, but all were easily fixable. For instance, an administration utility called admind was running in insecure mode. This could allow someone get root access, from which it's possible to cause all kinds of trouble.

But this problem can be fixed either by installing the admind jumble patch from Sun for Solaris 2.3 or disabling the admind command, if you can get along without it.

Another potentially serious problem: The wall daemon was running on the system. Because the wall daemon allows broadcast messages to be sent over the network, an intruder could possibly impersonate the systems administrator and use that account to send a message to users to change their passwords to something that the intruder could use. A hacker could also make the wall daemon send escape characters to users' systems, allowing the intruder to enter commands remotely. Removing the wall daemon plugs the security hole.

Finally, we found the Finger and rusers commands on the system. The Finger command is somewhat dangerous, because it can provide enough information to the intruder — about machine use, log-in accounts, users' origination, and other clues — that security could be compromised. The solution: Remove the Finger daemon or replace it with another similar utility that does not provide as much detail.

The rusers command provides important information such as number of users on-line and account names. There's no doubt about it; you should nuke rusers by removing it from the system entirely.

SOFTWARE

BSDI Internet Server 1.1

VERY GOOD

We only found one security problem in BSDI: The Finger command was installed on the machine, and we removed it. Kerberos server software is also included. BSDI also has another nifty feature, which we didn't test: According to the company, you can build a fire wall using a program called screend (which is available from ftp.vix.com) and a firewall toolkit is available via anonymous FTP at ftp.tis.com.

SCO Global Access 3.0

GOOD

Many common, moderately serious security violations surfaced in Global Access, but they're all easily fixed. For example, anonymous FTP directories were owned by user FTP. The wall daemon was running with no authentication.

We also found the Finger and rusers commands on the server.

Slackware Professional Linux 2.1

GOOD

We found a moderate number of security problems in Slackware. The most serious: The root account did not have a password and could therefore allow any intruder to log in as the privileged user root.

You can fix the problem by merely assigning a nontrivial password (reasonably secure so as not to be guessed) to all accounts, including root.

We also found directories owned by FTP. This is a little scary because world-writeable (writeable by anyone) or FTP-group-writeable directories are often used as drop points for trading illegal material, and the owner of the system may be held liable for storing this material.

Also, if a directory of a file is owned by FTP, any anonymous FTP user can log in and possibly overwrite those files with viruses or other Trojan programs. If the main directory (usually /pub) is owned by FTP and is writeable, an intruder may gain shell access by creating certain files that give access.

The fix: You can change the ownership of those anonymous FTP directories or files that belong to user FTP.

The BBN Internet Server comes with a power conditioner, Pentium computer, monitor, and keyboard.

Q: WHY IS UNIX SO HARD?

A: Lousy documentation.

The Unix realm is full of gurus and on-line documentation, and those are the tools by which most systems administrators learn to set up and maintain Internet gateways and servers. Perhaps because Sun and the three software vendors included in this comparison are used to selling products mostly to this audience, they often leave out documentation, expecting their customers to either already know the ins and outs of Unix or download information from the Internet. Because they've just updated their existing products a little, then repackaged them as out-of-the-box Internet servers, these vendors seem not to realize that the new audience for their products generally consists of people less experienced at Unix system administration than their traditional customer base. That's probably why many of the Unix-based products we looked at had three types of documentation to help configure Unix as an Internet gateway: scanty, wrong, and none. Some of these vendors referred us to Frequently Asked Questions documents and on-line manuals on numerous topics, apparently never considering that we expected all of the documentation necessary to run the product to be included in the box.

Documentation

HARDWARE/SOFTWARE

BBN Internet Server

GOOD

In keeping with BBN's paradigm of Macintosh console management for its Internet server, no Unix manuals are included with the Internet Server, which leaves a big hole in an otherwise great set. Instead, you get two software manuals detailing FrontDoor, the Macintosh administration software. The FrontDoor users' guide explains how to use the Macintosh interface to maintain and configure the Unix-based PC, and it does it with clear, easy-to-follow instructions. Screen shots are plentiful and useful. Topics are well indexed and logically organized. Discussions explaining how to create and manage World Wide Web (WWW) and Gopher documents are covered adequately and are quite readable.

The BBN also ships with the documentation for the separate hardware components making up the system. Separate manuals cover the SCSI adapter, video card, motherboard/base system, tape drive, and adapter. These manuals are generally adequate as reference guides.

Sun Netra Internet Server

SATISFACTORY

Netra's documentation is straightforward and simple. The manual is only 66 pages long and includes a table of contents, an index, and a brief glossary. The manual explains the various setup options and the use of the systems administration tool. We found the Netra documentation to be accurate, but felt it should include more information on topics such as the setting up of anonymous File Transfer Protocol (FTP). Sun's documentation does, however, include an attractive 300-page book, *Finding it on the Internet*, by Paul Gilster, but the book provides little help to systems administrators because it deals solely with the client side of Internet navigation.

SOFTWARE

BSDI Internet Server 1.1

POOR

The only documentation included with BSDI Internet Server was a small, 100-page booklet describing the operating system and a single type-written page describing the EZ-CONFIG program diskette. Pages were missing from this booklet, which wasn't obvious at first, and this made completing installation difficult. The step-by-step instructions in the booklet were fairly easy to follow, but we found it difficult to find where we had left off once we put it down because of the manual's small size and construction. The manual included a table of contents but no index.

SCO Global Access 3.0

UNACCEPTABLE

We generally hate to rate any product unacceptable in any category, but we don't have a score for "pathetic." Seven manuals might seem more than an ample amount of information, but SCO's manuals manage to make a sloppy product totally incomprehensible.

For instance, sample files included in the proper directories were set up differently than those in the documentation. We tried setting Domain Name Service (DNS) according to both sets of

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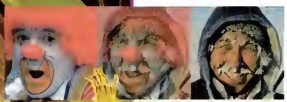

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PRODUCT COMPARISON

TECHNICAL SUPPORT

How bad could it be?

A typical experience with SCO's technical support staff was the problem we had getting drivers for our Ethernet card. We waited nearly a week to receive a diskette that was to have been sent to us overnight. On our dime, in fact. SCO's media upgrade department required a Federal Express account number from us in order to expedite the shipment. Expedite? Somebody, dust off the cobwebs!

We called two days after we should have seen the drivers and the shipment had not yet gone out. It still took another two business days to receive it.

examples; neither worked. Dazed and confused, we called technical support. After they determined they couldn't help us over the phone, we received a multipage fax with sample files that worked for our installation. It was to be the first of many such faxes that the company sent us during our testing.

Technical support engineers joked more than once that we should have known better than to follow the printed instructions; then they faxed us the correct information. Good configuration examples were difficult to come by, as well.

In fact, we spent most of our time setting up the SCO gateway using faxed instructions that superseded the documentation. The fact that SCO's technical support staff had a ready supply of helpful, detailed faxes to guide us through numerous setup procedures indicates that the company has known for quite some time about the numerous inaccuracies and omissions in both its man (manual) pages and documentation.

Even when critical steps or procedures were correctly described, they were often buried in reference chapters and not mentioned in the chapters on setup and configuration, nor in the indexes.

We'd say we'd like to see the manuals better indexed, but maybe it's better for all concerned if the information remains buried — in a deep trench somewhere.

■ Slackware Professional Linux 2.1

The manual that ships with Slackware Linux is the standard public-domain documentation we've seen shipping with at least one other commercial version of Linux.

The paperback book is more than 500 pages and yet, as with other Unix manuals we've seen, barely scratches the surface in many areas of configuration and usage.

Anonymous FTP configuration, for instance, is not even mentioned, and sendmail setup is conspicuously absent.

The manual itself is somewhat useful, but because it's generic, it often makes reference to features or utilities that may not be included in all versions of Linux. It often refers users to other pieces of documentation or on-line sources. Its index is accurate but incomplete. Many times, we could not find topics in the index but later found discussions in the manual.

No screen shots are included, but a fair number of syntax examples are provided with adequate discussions. The manual also includes references to specific Internet sites where more information is available on various topics.

Slackware rounds out its documentation set with the inclusion of standard Unix man pages, as well. These are generally useful but omit some needed entries.

▸ How we tested (from page 71)

still another full word score. In essence, the less we had to do to get started and the more guidance we got, the better the score.

Conversely, if we correctly followed written instructions and frequently encountered frustration, unexpected behavior, or system lockups or crashes, the product received a lower score.

The two hardware-based products — the BBN and the Netra — came partially configured according to information requested of us by the vendor prior to shipping.

In other words, whenever you order any BBN InterNet Server, you must specify the software modules that provide the capabilities you want, and BBN installs those modules on the unit before it is sent to you. In a sense, every machine is somewhat customized before you get it, but BBN performs this service for every unit that ships. For instance, you could decide to order a unit that could handle E-mail and news group administration, and it would be shipped to you with software for E-mail support and news group capability already loaded onto the machine.

We evaluated each product as it arrived at our office. This decision resulted in the hardware products potentially being rated higher in the category of installation than those consisting only of software, because some of the configuration work — software installation — had already been done.

This is fair for three reasons. First, the vendors of these products all aggressively advertise that they dramatically reduce the amount of time and hassle required to start doing business on the Internet, so it's only fair to evaluate them based on exactly how easy it is to do this. Most of our readers indicated that ease of setup and administration were their primary consideration, and as long as these goals are achieved, they're happy.

Second, these vendors preconfigure all of the units they sell this way, not just the units purchased under special service arrangements. Finally, a software-only product, BSDI Internet Server 1.1, actually managed to do better in the category of setup than a preconfigured hardware product, the Netra, so our scoring system doesn't preclude a well-designed software product from beating a hardware vendor on ease of installation.

Our DNS setup on each system was complete when we were able to resolve host names on the Internet. We then followed the setup procedures for E-mail and

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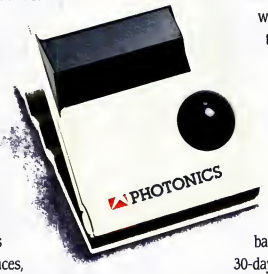

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verified that each product allowed mail to pass from our local clients to hosts on the Internet and vice versa.

Next, we established the capability to support anonymous FTP services by logging in anonymously from a remote site and downloading files from the /pub directory.

Finally, we created a sample Home page to serve as our new face on the Internet. This page displayed information about *InfoWorld* and the people who work there, giving editorial contact and subscription information. We verified that we'd done this correctly by viewing each Home page using a WWW browser running on a remote system. We gave extra points for Gopher capabilities.

After we'd scored these products in each subcategory, we totaled these scores to come up with a final setup score.

Ease of administration

In this category, we tested how easy it was to make changes to each service. Products that let administrators make changes by editing files manually earned at least a satisfactory score. Products that allowed remote access or remote-control administration of all of our predefined services received a higher base score of good. Text and GUI configuration programs usually made performing these tasks much easier and so earned higher scores.

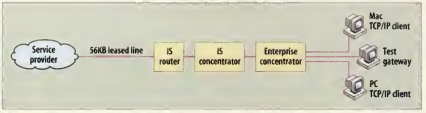
We also added points for some sort of automated administration. For instance, products earned higher scores if they let us send and receive mail across the Internet without further configuration chores after we had added a host.

We also evaluated the operating system for each server, testing how easy it was to do basic maintenance tasks such as adding users and hosts. Products that included no hardware were judged on the same criteria as those that did.

WITH APOLOGIES TO JEFFERSON AIRPLANE

Global Access
Gave us headaches.
BBN still stood tall.
And the Netra,
Kept on talking.
And has no monitor
at all.
BSDI did just fi-ine.
We were like Alice,
At the Cyber-Mall.

Internet servers: our enterprise setup



We tested each Internet server in this comparison on our enterprise network by installing it in turn as our test server. (We used a Macintosh for BBN Internet Server testing only; BBN requires a Mac to run its FrontDoor interface.) Our service provider was Barrnet, but you can use whichever one you choose for your own network.

STRUCK / INFOWORLD

Security

Security is one of the most important issues IS faces when setting up an Internet server. To test each Internet server for security holes, we used a commercial security probe application, the Internet Security Scanner (ISS).

ISS runs on a remote system and checks for weaknesses in the domain or on a single system. We checked each gateway individually and scored each product based on the number of and type of security holes found. These security checks were performed against our Internet servers only and did not preclude the use of additional security measures, such as fire walls and a secure location for the servers. (See security story, page 84.)

To earn a satisfactory score, a product could not have any serious security problems that couldn't be easily removed — by deleting a command or setting a password, for example — and could not have more than five minor security flaws.

(A typical example of a minor security flaw is the presence of a command that might give hackers some information about the system that could help them break into a network but doesn't in itself provide a pathway. The Finger command, which gives outsiders information about users and their log-in names, is such a command.)

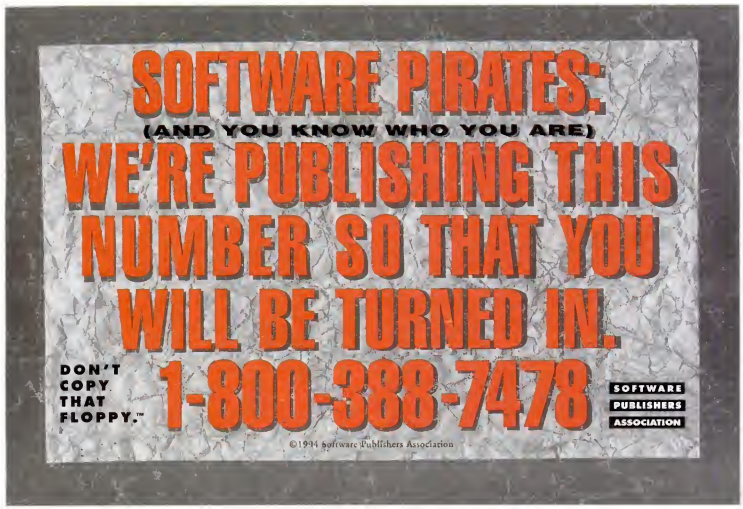
For a score of good, a product had to have no more than three minor security problems. A score of very good was awarded to products that had no serious flaws and no more than two trivial ones. To receive an excellent score, products could have no serious flaws and no more than one minor one.

SUPPORT AND PRICING

Documentation

Documentation scores reflect the quantity and quality of both printed and on-line information. We awarded extra points for extra features such as tutori-

▸ How we tested (page 85)



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SECURING YOUR INTERNET GATEWAY

By Rik Farrow

THE INTERNET PROVIDES a vast repository of services and information while making it easy for your company to supply information to the world at low cost. But there is a darker side to this picture — universal access works both ways. The more open your network is for your Internet users, the more open your organization is to hacking attempts from the Internet.

Some companies have even avoided getting Internet connections because of the very real security threats. Others have provided minimal Internet connectivity by providing a gateway to Internet E-mail.

But how long will their users be content with just E-mail and no Mosaic? With products such as Spry Inc.'s Internet In A Box and Microsoft Corp.'s expected Windows 95, your users can easily make an end run around you and install their own Internet connections — unless you provide a better, faster one.

Connecting a business to the Internet and not installing a fire wall is like getting drunk and walking through a bad part of town wearing a Rolex or diamond earrings. You might get through OK, but you are certainly taking a chance, and a foolish one at that.

Today, even universities, which have traditionally been wide open, have fire walls. You would be wise to audit your organization's network-accessible assets and chose the level of security you need.

To visualize the trade-off between Internet access and security, try to think of security products as forming a continuum (see diagram, page 85).

At one end, your internal users have complete, unfettered access to the Internet, and you have no protection from Internet attackers. At the other end, you have no Internet connection at all and have complete security from Internet-based attacks. Finding the right trade-off between these two obviously untenable positions is 90 percent of the battle.

• Send comments on this review to lisa_staplet on@infoworld.com

All of the products in this comparison provide complete access to the Internet. The gateway and all the client systems served by it are completely exposed to attacks, while providing the clients with full access to the Internet. This is not necessarily a bad thing — most universities have similar setups. But if you have assets to protect, you must either set up an isolated network for the Internet connection or use some means of protecting yourself from other Internet users.

To put the threat into proper perspective, only about 9 percent of all security incidents are Internet related, estimates Bill Pozerycki, the service manager for Digital Equipment Corp.'s Firewall Service. Your organization is much more likely to be a victim of a natural disaster, an insider, or person coming in through a modem than it is to suffer an attack from the Internet.

But it is also true that to some extent, just having an Internet address leaves your network vulnerable. For just as there is software to scan phone numbers for modems, there is software to scan Internet addresses, so anyone can find out where to mount an attack if they're determined enough.

So what can you do to protect yourself? Plenty.

ROUTERS TO THE RESCUE? First of all, your connection to the Internet requires a router, and routers can be used to supply some protection. The routers do what their name implies — route packets between different networks. Routers can be programmed to ignore traffic from specific networks, but this is not a useful approach for protecting your network against Internet attacks. There are tens of thousands of networks, and blocking "dangerous" network addresses is not generally a feasible solution.

Instead, your Internet router can block dangerous services and permit certain incoming requests only to predesignated servers. Recently, the Computer Emergency Response Team, which is based at Pittsburgh's Carnegie-Mellon University, announced that its Network File System (NFS) was being used to break into systems. You can partially protect yourself by blocking ports; this means setting up access-control lists using your router's command language. Most modern routers have this capability. In particular, many NFS attacks can be thwarted by blocking ports 111 and 32049 of the User Datagram Protocol service.

You can also protect yourself by making sure that users only have access to the Internet services you set up — such as the World Wide Web, E-mail, and anonymous File Transfer Protocol (FTP) — only on designated machines. Many large corporations take this approach, and they set up their routers to only permit connections to these services on machines that are separated from their critical business network by fire walls or other means. This prevents your own users from setting up private FTP or Web servers — which might have security holes in them — behind your fire wall.

Stand-alone security products are generally more secure than routers, but they're expensive. Typical of products in this category is CheckPoint Software Technologies Ltd.'s FireWall-1, which runs on a Sun Microsystems Inc. workstation and can filter incoming and outgoing Internet traffic. Starting at around $5,000 for even a small network, FireWall-1 differs from routers in that it can dynamically open paths for protocols, such as FTP, which require a return path that routers cannot handle in a secure manner. FireWall-1 also has an easy-to-use graphical interface, alarms, and logging, which generates reports of unusual activity, a capability not found in most routers. Austin, Texas-based SmallWorks offers a similar product for Suns, called NetGate, that doesn't include CheckPoint's great graphical interface but sells for just $2,500, making it more affordable for smaller companies.

FIRE WALLS FOR SAFETY. Routers and products such as FireWall-1 are important components of fire walls, but they don't provide some of the features you'd want in a complete firewall solution. For example, routers and FireWall-1 pass traffic without examining the contents, making it possible to "tunnel" data right through the router. And FireWall-1 lets the fsp command — used by hackers to transport their electronic tools — run on any port whatsoever, which is a dan-

• *For an interesting story on security, check out 'Hey Hackers! Secure Computing says that you can't break into this Telnet site,' Government Computer News, Jan. 9, 1994, page 38.*

ON-LINE SECURITY HELP

Security is a hot topic on the Internet. The following FTP sites have papers and tools dealing with fire walls and security:

ftp://ftp.cert.ocg/pub/tech_tips

ftp://ftp.win.tue.nl/pub/security

ftp://coast.cs.purdue/edu/pub

If you're using Mosaic, the following sites contain useful on-line information about security:

http://www.greatcircle.com/firewalls

http//www.tansu.com.au.Info/security.html

Security product contact list

ANS Interlock
ANS CORE Systems Inc.
1875 Campus Commons Drive, Suite 220
Reston, VA 22091
(800) 456-8267
fax: (703) 758-7717
E-mail: interlock@ans.net
info@ans.net
FTP (public): ftp.reston.ans.net

Site Patrol
B8N
150 Cambridge Park Drive
Cambridge, MA 02140
(508) 873-2000

Janus
8order Network Technologies Inc.
Suite 1400
1 Yonge St.
Toronto, Ontario
Canada
M5E 1J9
Phone: (800) 334-8195 or (416) 368-7157
fax: (416) 368-7789
E-mail: info@border.com
sales@border.com
FTP (public): ftp.border.com
WWW: http//www.border.com

FireWall-1
CheckPoint Software Technologies Ltd.
1 Militia Drive, Suite 5
Lexington, MA 02173
(800) 429-4391
fax: (617) 863-0523
E-mail: info@checkpoint.com
WWW: http://www.checkpoint.com

Digital Firewall Service
(previously DEC Seal)
Digital Equipment Corp.
(508) 496-8626
FTP (public): ftp.digital.com/pub/Digital/info/document/firewall*.*
WWW: http://www.digital.com/info/document/firewall*.*

CyberGuard
Harris Computer Systems
2101 W. Cypress Creek Road
Fort Lauderdale, FL 33309
Data transmission:
(800) 521-7742

Eagle
Raptor Systems Inc.
69 Hickory Drive
Waltham, MA 02254
(800) 932-4536
fax: (617) 487-6755
E-mail: info@raptor.com
FTP (public): ftp.raptor.com

Sidewinder
Secure Computing Corp.
1707 Ascot Way
Reston, VA 22090
(703) 318-9166

NetGate
SmallWorks
4401 Stony Meadow Lane
Austin, TX 78731
Phone and fax: (512) 338-0619
FTP (public): ftp.smallworks.com

Gauntlet
Trusted Information Systems Inc.
3060 Washington Road
Glenwood, MD 21738
(301) 854-6889
fax: (301) 854-5363
E-mail: netsec@tis.com
FTP (public): ftp.tis.com
WWW Home page: www.tis.com

UNIX AUDITING PRODUCTS

Internet Security Scanner 2.0
Internet Security Systems Inc.
2000 Miller Court West
Norcross, GA 30071
(404) 441-2531 or (800) PROBE62
E-mail: iss@iss.net

OpenVision
SecureMax
Open Vision
999 Baker Way
San Mateo, CA 94404
(415) 341-9017

Raxco Inc.
2440 Research Blvd.
Rockville, MD 20850
(301) 258-2620

Vesoft
Hewlett-Packard Security
1135 S. Bewerly Drive
Los Angeles, CA 90035-1119
(310) 282-0420

The Internet access/security continuum

Different types of Internet security products offer varying levels of protection. Here, we track a range of security solutions from the least secure to the most secure.

HACKER ATTACK

Last week's Internet attack on Stanford University was the result of Internet spoofing, which involves tricking a router into believing that the intruder's communication signal is coming from a "friendly" Internet address on a "friendly" computer. It's the electronic version of presenting a forged, typewritten letter to clean out someone else's bank account.

gerous situation. By running **fsp** on the Domain Name Service (DNS) port, they can tunnel right through a router. There's also no way to authenticate users by using a password to prove a user's identity.

A true fire wall is a computer dedicated to providing a secure gateway between the Internet and your internal networks. Fire walls typically provide a more noticeable barrier to the Internet for your internal users, but they provide much better security than router-only solutions. Where a router can be configured to deny certain services, fire walls support only a limited set of services, making it unnecessary to block services. In a fire wall, everything that is not specifically allowed is blocked by default.

True fire walls come in three broad categories: do it yourself, consulting services, and packages. The type of firewall product you should buy depends most upon your level of expertise with the TCP/IP protocols, C programming, and Unix. Today, all major firewall solutions are based upon Unix systems because Unix offers a multitasking system with built-in security and networking.

In the roll-your-own category, there are two outstanding solutions. The first is a set of software modules used to control Internet service to clients. Called Socks (short for sockets), this software library provides a service that authenticates and controls use. Socks requires the use of modified Unix commands — **rftp** for FTP, for instance — but is otherwise transparent to the user. The downside to this approach is that most point-and-click TCP tools on your Macintosh or PC won't work with Socks. You can learn more about Socks (and get the software) via FTP from **ftp.nec.com:/pub/security/socks.cstc.**

If you're into security systems of the rich and famous, Trusted Information Systems Inc. (TIS) built the firewall software used to protect the White House's E-mail and Web server. The toolkit contains proxy servers, which are special networking applications that pass approved FTP, Telnet, **rlogin**, Mosaic, and other services through the fire wall. There's also support for advanced authentication techniques such as one-time passwords. You can get information about the Firewall Tool Kit from **ftp.tis.com** in the **/pub/firewalls/toolkit** directory.

If you're not up to building your own secure networking applications from Internet tools, consider consulting services. TIS installs a version of its toolkit, named Gauntlet, as a consulting service. Digital also provides a consulting program called the Digital Firewall Service (formerly called DEC Seal). Digital personnel come to your facility and install a collection of proprietary and public domain software and train you in its use.

The advantage of either of these consulting services is that you get a fire wall individually tuned for your organization's setup; training; and the source code for what you receive. With some in-house expertise, you are in a good position to analyze what you get from either TIS or Digital, because you have the source code and so can even potentially modify your fire wall or add new services.

Other firewall solutions are black boxes — you can't see what's inside and must trust the vendor, which might be just what you want to do if you don't know much about TCP/IP. This last category of firewall packages includes drop-in products from a variety of vendors. ANS Core Systems Inc.'s ANS Interlock runs on either IBM RS-6000s or Sun Sparcstations and is delivered on tape. Much of the configuration has already been done for you, and ANS will provide you with updates via the Internet.

BBN sells an add-on to the gateway product that provides firewall services. Unlike other firewall vendors, BBN manages the fire wall for you under its Site Patrol Service program, watching log files and taking action to protect you from attack. The BBN product appears to be a strong fire wall, with the underlying Unix system completely hidden. The limitation here is that you can only use this product if you are in the regions served by Barrnet or Near-Net. BBN's firewall/gateway service is also expensive, but it will cost about as much as ANS Interlock's monthly lease rate.

▸ **Check out TIS' fire wall** docs: http://www.tis.com

Border Network Technologies Inc. (BNT) sells an easy-to-use product named Janus, which runs on a PC with two network interfaces. You configure it completely through a menuing system, so even though you know there's a Unix system on the network somewhere running DNS, anonymous FTP, Netnews, and a Web server and providing transparent access to the Internet for your users, you never see it; you only see the menuing system. For those unfamiliar with Unix systems, this is really a plus, especially when you consider how important a firewall system is to companies that use one. Another important plus: BNT has modified the underlying Unix operating system to remove possibly dangerous operating system services. For instance, the **set-user-id** property, a big source of problems in Unix systems, has been exorcised. The network-enabled operating system cannot even create new executable files — so no hacker could upload dangerous software to the fire wall and execute it. And for about $11,000, it's one of the cheapest fire walls available.

A similar solution, Raptor Systems Inc.'s Eagle fire wall for most Unix platforms, has a reputation for paranoia. It watches its own operation and shuts down the Internet connection if it detects changes in its own software or suspicious programs running on the fire wall.

And for those who are truly paranoid, you can run a fire wall on top of a secure operating system. Such operating systems are usually based on existing platforms, but commands that pose special security risks have been re-engineered or removed to plug dangerous security holes. Secure Computing Corp. has announced a fire wall product named Sidewinder that will be based upon a secure version of the Unix operating system. And Harris Corp., which sells the Nighthawk secure operating system, also sells CyberGuard, a firewall product that runs on that platform.

Using a secure operating system for the base of a fire wall provides fine-grained control over the firewall software, its configuration files, and log files. Essentially, you can create sets of programs and specify the files they may read or modify, isolating the firewall software from other components and the operating system.

Of course, plugging security holes isn't easy, but not to do so is dangerous and foolhardy. But at least today, the increasing number of interesting security products bodes well for IS executives whose companies are just starting to venture out into the large, uncertain electronic frontier known as the Internet.

▸ *The identd program can be set up to do more rigorous authentication. Check out http://iss/~iss for a Frequently Asked Questions file that includes information about identd.*

▸ **How we tested (from page 82)**

als. We also incresd the score for good on-line documentation and detailed man (manual) pages. Poor organization, missing or wrong information, or an incomplete index or table of contents lowered the score.

Support policies

To get a score of good, vendors had to provide free technical support. (Vendors that didn't offer free support but did provide some form of support received a score of satisfactory.)

We awarded extra points for a toll-free line, a money-back guarantee, or support via E-mail, fax, or BBS.

Technical support:

We based technical support scores on the quality of support we received during several anonymous calls to vendors and on the availability of knowledgeable technicians. We awarded satisfactory scores for professional demeanor and correct answers to our questions. We subtracted points for excessively busy or unanswered phones, long waits on hold, unprofessional service, and answers that were wrong or incomplete.

Price

For the software products, we looked at the price per user. If quantity discounts were available, we used the cost per user for a 16-user license. We also factored in support costs.

We evaluated the hardware/software combinations by adding the support cost to the price of the model we evaluated.

The pricing scores take into account the prices of competing products and the intended market for software of this kind. The score in this category is not a reflection of the product's overall value or the quality of the product.

Sun and hyperSPARC: Achieving Stellar Performance

The latest product announcement from Sun Microsystems revolves around the dazzling performance of hyperSPARC microprocessors from ROSS Technology, Inc., a subsidiary of Fujitsu, Ltd. We are proud to have earned the business, and we look forward to sharing Sun's accomplishments with their newest SPARCstation™ 20.

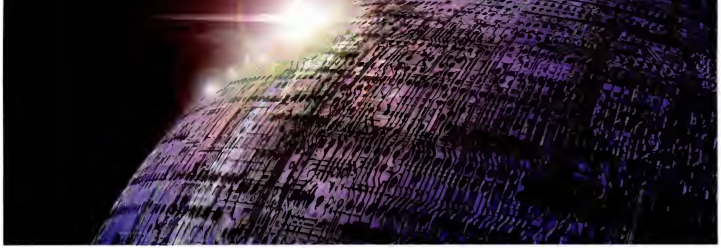
This design win clearly shows the workstation world three things: the integral nature of high-performance processing in Sun's business plan; ROSS' prominent place on the SPARC roadmap; and that hyperSPARC processors have passed every test for Sun's high-performance desktop machines.

Our design is based on 0.5µ triple-layer metal CMOS technology that has demonstrated superior scalability over time. With optimized micro-architectural partitioning, and utilizing advanced multi-die packaging (MDP), ROSS packed a 6-million transistor CPU chipset (with an integrated 256-Kbyte second-level cache) into a standard 131-pin package. In addition, the hyperSPARC CPU chip operates at a low 4.0W power dissipation under typical operating conditions, even at a clock frequency of 100 MHz. With full Solaris® compatibility, users are integrating these new hyperSPARC-based SPARCstation 20s into their workgroups without modifying their application software.

This same hyperSPARC technology, used by Sun to enhance the industry's most successful high-end workstation family, is also available as user-installable upgrade modules directly from ROSS. We wish Sun exceptional success with this new product, which makes a major contribution to Sun's price/performance leadership. As Sun says about its customers, we now say about ours: "We're helping them run better."

For more information call:
U.S.: 1/800/774-ROSS
International: 512/919-5207

ROSS TECHNOLOGY, INC.
A Subsidiary of Fujitsu, Ltd.



5316 Hwy 290 W., Austin, Texas 78735 • U.S.: 1/800/774-ROSS International: 512/919-5207 FAX: 512/919-5200 • E mail: ROSS_INFO+aAYN%AYN@MCIMAIL.COM
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▸ Windows word processor

WordPerfect 6.1 battles for best of breed

■ WordPerfect 6.1 and Word for Windows 6.0 now neck and neck in word processor race

By John Lombardi

FOR NOVELL INC., the second time's the charm. Version 6.0 of its flagship WordPerfect word processing software stumbled into a distant third place in our last comparison of Windows word processors. (See Feb. 7, 1994, page 66.) The upgraded WordPerfect 6.1, now part of Novell's Perfect-Office suite, fixes the crippling bugs that tripped up the performance of the previous edition and adds enough features to raise its score to almost match that of its archrival, Microsoft Word for Windows 6.0.

This intense battle for first place reminds us of the early days of word processing software, when upstart WordPerfect challenged then-leader WordStar for market dominance. The end result of these battles, both past and present, is better software for end-users.

People with general word processing needs will be satisfied with either product. Both programs offer a strong set of features and are easy to use. Both can handle just about any imaginable word processing task. What distinguishes each is the features it emphasizes, the style of its interface, and its integration with other productivity programs.

FEATURES

After running our full test suite on Version 6.1, we found substantial positive changes in only a few areas and no new bugs. These positive changes caused us to revise our scoring in six performance categories. Fortunately for Novell, those six categories include ones that Version 6.0 had the most trouble with.

Novell also made minor improvements throughout this release in the cosmetic appearance and consistency of the user interface, the packaging and contents of the online help and the hard-copy documentation, and the operation of various features. Although we appreciated these enhancements, they weren't significant enough to alter our scoring in the affected category. The scores for the following categories remain the same as those in our Feb. 7, 1994, comparison: mail merge, very good; long documents, satisfactory; file management, very good; workgroup and networking, very good; macros, good; documentation, excellent; support policies, very good; and technical support, good. (For a full description of our test suite, see How We Tested, Feb. 7, 1994, page 67.)

PERFORMANCE

Basic editing and formatting

We evaluated basic editing and formatting by performing common editing tasks such as search and replace, drag and drop, and cut and paste. WordPerfect 6.1 earned a higher score than Version 6.0 due to new editing features.

We were able to drag and drop a selection not only within an open document but also between different documents open on-screen and between most Windows-compatible applications. This brings WordPerfect's drag-and-drop capabilities up to the market standard.

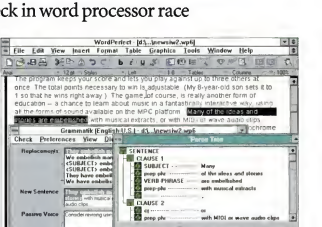
WordPerfect added a Make It Fit Expert for those people who have to fill a particular amount of page real estate. Make It Fit takes your text and fits it into as many pages as you specify. For example, if you have 10 pages of text and only eight sheets of paper, the Make It Fit expert shrinks the type face and adjusts the margins until your document squeezes onto those eight pages. WordPerfect has a limit of 50 percent shrinkage or expansion; the equivalent Word for Windows feature can only change the document by one page. Our testing shows that WordPerfect's Make It Fit Expert generally works well. However, complex documents with stylized text or graphics images can end up with layout problems — the Make It Fit expert may move these non-text elements to the wrong place.

Another feature that WordPerfect has but Word for Windows doesn't is the capability to search for word forms. For example, you can search for "go" and the function highlights all instances of "go," "went," and "gone" in your document. We liked this feature and found it useful, being the sort of people who generally conjugate their verbs. On the other hand, WordPerfect does not have the equivalent of Word for Windows' sounds-alike search, an option we'd like to see added.

WordPerfect also made a slew of ease-of-use enhancements. It improved the word processor's OLE implementation; WordPerfect 6.1 is an OLE client. For example, we were able to use OLE when both the server and client documents were open.

It's easy to insert special, foreign-language, or graphic characters in the text, and bullets require only a single click to insert.

On the down side, our test that moves tabbed columns from one place to another continues to suffer from the clumsiness of WordPerfect's special in-stream codes. Although the program does a good job of automatically locating its codes within the text stream, we still risked unanticipated results if we selected columns with one set of tabs and moved those columns to a location that had different tab settings. We had to use the Reveal



WORDPERFECT'S *sophisticated grammar checker has gotten even better; it now parses sentences.*

Report Card

Windows word processors

	Weightings	WordPerfect Version 6.1		WordPerfect Version 6.0		Word for Windows Version 6.0	
Performance							
Basic editing and formatting	125	Very Good	93.75	Good	78.12	Excellent	125.00
Proofing utilities	100	Very Good	75.00	Good	62.50	Very Good	75.00
Mail merge	75	Very Good	56.25	Very Good	56.25	Very Good	56.25
Layout	125	Excellent	125.00	Poor	31.25	Good	78.12
Tables	50	Excellent	50.00	Very Good	37.50	Good	31.25
Long documents	75	Satisfactory	37.50	Satisfactory	37.50	Very Good	56.25
File management	75	Very Good	56.25	Very Good	56.25	Very Good	56.25
Workgroup and networking	50	Very Good	37.50	Very Good	37.50	Excellent	50.00
Import and export	75	Very Good	56.25	Poor	18.75	Very Good	56.25
Macros	50	Good	31.25	Good	31.25	Very Good	37.50
Support and value							
Documentation	50	Excellent	50.00	Excellent	50.00	Excellent	50.00
Support policies	25	Very Good	18.75	Very Good	18.75	Excellent	25.00
Technical support	25	Good	15.62	Good	15.62	Excellent	25.00
Value	100	Excellent	100.00	Very Good	75.00	Excellent	100.00
Final score		**8.0**		**6.0**		**8.2**	

PREVIOUSLY REVIEWED*

*Reviewed Feb. 7, 1994, page 66.

GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta-test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parenthesis) of each criterion by its rating, where:

Excellent = 1.0 – Outstanding in all areas.

Very Good = 0.75 – Meets all essential criteria and offers significant advantages.

Good = 0.625 – Meets essential criteria and includes some special features.

Satisfactory = 0.5 – Meets essential criteria.

Poor = 0.25 – Falls short in essential areas.

Unacceptable or N/A = 0.0 – Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little.

Weightings represent average relative importance to *InfoWorld* readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

The Test Center Hot Pick is *InfoWorld*'s new award for outstanding products we have evaluated in scored stand-alone reviews or product comparisons. To receive the Test Center Hot Pick seal, a product has to offer what *InfoWorld* deems to be a stand-out feature or technology that is unusually valuable or revolutionary compared to competitors. The product must also score at least satisfactory in all Report Card categories and receive a final score of 7.0 or more.

STORAGEEXPRESS

Date	Time
12/8/94	3:33:00 PM
12/9/94	1:49:05 PM

90 *The Storage-Express backup system does it all.*

Codes screen to show the location of the tab-set codes before we made our selection to ensure that we included the column tabs in the move. This is an extra step we're not fond of performing.

WordPerfect 6.1 still has room for improvement (more options for the Replace function would be a good place to start), but overall, the expanded feature set and better ease of use raise its score for basic editing and formatting from good to very good.

Proofing utilities

Running the product's spelling checker, grammar checker, and thesaurus through their paces revealed solid improvements in WordPerfect's spelling and grammar checking.

Grammatik, the integrated grammar checker, is significantly better. In reviews of earlier versions, we liked Grammatik better than Word for Windows 6.0's grammar checker, but we didn't experience any extraordinary benefit from its existence. This version, however, made its presence known with sophisticated functionality that makes it much better than its previous incarnations. For example, Grammatik now lets us display parts of speech and parse sentences so we can produce practically perfect prose.

The product is vastly improved in the area of layout. With WordPerfect 6.0 we could not complete our layout task, but we have only praise for WordPerfect 6.1's layout capabilities.

We found that the spelling checker in the previous version would not accept an accented character in the spell-check window unless we used the Alt-keypad method. Version 6.1 provides a graphical method for handling accented characters but it has some pitfalls. The new method pops up the Insert WordPerfect Characters box while spell-checking. However, our tests proved that when the Insert Characters box is brought up after the spelling checker is launched, the inserted character ends up in the text at the point of the cursor, not in the spell-check window. Going through the process a second time resulted in the accented character appearing in a field in the spelling checker. We were able to reproduce this problem at will, which indicated that it is a minor bug that needs fixing. Despite this bug, we're glad to see a more graphical method applied to this task.

We also discovered that Novell still chose to implement the Skip Always option in the spelling checker so that it overlooks target words that don't have the same capitalization as the original source word. We still find this annoying.

WordPerfect 6.1's spelling checker now matches that of Word for Windows, and its grammar checker continues to outshine Word's. We raise its score for proofing utilities to very good.

Layout

For this task we created a complex newsletter layout that pushed these products into acting like a desktop publishing program. We have only praise for WordPerfect 6.1's layout capabilities.

We could not finish this task when we evaluated WordPerfect 6.0 because we experienced consistent and repeatable General Protection Fault errors when using the layout tools.

Version 6.1 no longer dies during this test — in itself a great improvement. That Version 6.1 does a superior job at desktop publishing

■ Product summary

WordPerfect 6.1
Novell Inc., Orem, Utah
(800) 451-5151 or (801) 225-5000

This is the product that Version 6.0 was meant to be. Novell fixed the bugs and made a host of feature and minor usability enhancements that indicate that WordPerfect for Windows has come of age.
Price: $395; $99 for upgrade; $129 for competitive upgrade.
Pros: Can't go wrong with this product for general word processing needs; table capabilities and complex layout capabilities are the best of the bunch.
Cons: Limited Replace options, small bugs in the spelling checker, twisted translations of other word processors' files; Reveal Codes feature required to make sure that things get moved with formatting intact.

Which route would you tak

Other parallel database software

New DB2 Parallel Edit

Outside North America, call Austria (0660 109); Belgium (02 225.33.33); Denmark (8030 4545); France (05.03.03.03); Germany (0130 4567); Italy (1670 18001); Netherlands (030 364040); Portugal (351.1.7915111); Spain (900 100 400). Information Warehouse is a trademark of International Business Machines Corporation. Oracle is a registered trademark of Oracle Corporation. © 1994 IBM Corp. All rights reserved

is an extraordinary bonus. We had no difficulty at all completing the newsletter, including resizing, rotating, cropping, placing, and moving text and graphics.

You can now manipulate the boxes (WordPerfect's name for frames) that contain graphic elements as effortlessly as you do the frames in Word for Windows 6.0. And where WordPerfect 6.0 had an inferior drop-cap feature, this new version has outstanding drop-cap capabilities.

TextArt, a WordPerfect feature, flexibly and effectively manages fancy display-type elements used for titles and banner headlines. Finally, Word Perfect 6.1 includes a contour text-wrap feature that flows text around the graphic itself rather than wrapping it around the rectangular frame that encloses the graphic. Word for Windows does not have this feature.

WordPerfect's layout capability earns a score of excellent.

Tables

Testing a product's table functions involved importing data from an Excel spreadsheet and checking to see what properties were retained. Version 6.0 had extensive table capabilities, but WordPerfect still managed to improve them in Version 6.1.

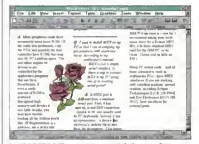
Tables in WordPerfect mimic the capabilities of a real spreadsheet, which makes them far superior to the tables found in competing products. Our chief complaint with the tables in Version 6.0 was that you had to interact more through dialog boxes than by on-screen dragging.

This interface style made Version 6.0's tables downright clumsy to use. Version 6.1's ease of use is considerably better. For example, now you can set column widths by dragging column boundaries with the mouse. However, as before, if you set the option to display gridlines, you cannot see the table's shading or borders on the screen.

Based on its overall improvement in usability, we raise WordPerfect 6.1's tables score to excellent.

Import and export

We tested import and export functions by swapping a complicated document between WordPerfect 6.1 and WordPerfect 5.2, Word



WORDPERFECT 6.1 *comes with better layout capabilities than Version 6.0. One advanced feature is contour wrapping, a capability that Word for Windows lacks.*

for Windows 2.0, and Ami Pro 2.0. This time WordPerfect did a fine job, which raised its score dramatically.

Our tests of Version 6.0 revealed that it was incapable of accurately translating documents created with earlier versions of WordPerfect, a sin for which we severely penalized it. This version of WordPerfect fixed those problems; graphics stayed with the document and in the correct location. Column widths were kept intact during translation, and fonts made the trip intact from one version of WordPerfect to another.

However, the translation from WordPerfect 6.1 to Word for Windows 2.0 is still idiosyncratic and requires considerable reformatting to get graphics and text elements placed correctly in the translated documents. Also, the translation from Word for Windows 6.0 to WordPerfect 6.1 does not always handle fonts or align text correctly.

Nevertheless, we consider the improved importing and exporting between WordPerfect 5.2 and WordPerfect 6.1 documents significant enough to merit raising its score from poor to very good.

SUPPORT AND VALUE

Value

A host of minor changes to the look of the interface, and the consistency of menus, dialog boxes, and mouse actions, as well as considerable improvements to the content of the help files, add to our more favorable opinion of this version of WordPerfect. These changes, on top of the major improvements that increase WordPerfect 6.1's report card scores, make it a better buy at $395 than the bug-laden Version 6.0. We raise its score for value to excellent.

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Optimized for Parallel	No	Yes
Consistent Architecture with SP2	No	Yes
Index Scan	No	Yes
Inserts	No	Yes
Selects	Yes	Yes
Updates	No	Yes
Deletes	No	Yes

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▸LAN-based backup system

Intel StorageExpress system boasts high capacity, few flaws

By Robert Gryphon

REMEMBER DISKLESS workstations? Intel Corp. has found another good use for one with StorageExpress XLC, adding a high-capacity 4mm DAT drive and automatic tape changer to automate backup of as much as 24 gigabytes (GB) at once. Although it has an unsophisticated tape rotation scheme and a few other flaws, StorageExpress is arguably the most comprehensive backup system available. It rivals the cost and capacity of solutions that require a dedicated server, and it has the option to exploit 100Mbps Ethernet to do it over a network.

We connected our StorageExpress XLC unit to a single-segment coaxial Ethernet LAN. The server we backed up was a 33-MHz 486 with 16MB of RAM running NetWare 3.12, and the workstation we backed up and used to test the backup software was a 33-MHz 486 with 8MB of RAM running Windows for Workgroups 3.11.

To test StorageExpress' speed, we ran the same backup-and-restore test plan we used in our last tape backup software comparison (see July 4, 1994, page 52), altering the report card slightly because StorageExpress is a combination of hardware and software. Also, by its nature, this unit is backing up data over the LAN, so we did not compare it to the speed of locally attached tape drives. In any case, faster networks are making that comparison less necessary.

FEATURES

Intended as a complete backup solution in a single package, StorageExpress consists of both hardware and software components. The hardware configuration we reviewed consisted of a server and a tape drive, two stacked "pizza boxes" connected by a SCSI data transfer cable. The whole system measures about 20 inches square by 8 inches high and weighs about 65 pounds. The device can accept either a single DAT or a cartridge loaded with six DATs, from which the unit can automatically change tapes internally.

The XLC's DAT drive has a locking door that reveals the autochange cartridge slots and a few controls to support them. Each DAT can hold 2GB, or as much as 4GB with compression. We found it easy to load and remove the cartridges.

The workstation contains the 1000MB hard drive. (Intel also sells a low-end StorageExpress ELD with only a 500MB hard drive and no DAT auto-changer.) The XLC system uses a file tracker database to store a log of as many past versions of backed-up files as possible. The hard drive also contains the runtime version of NetWare 3.11, which is StorageExpress' internal operating system. The control unit plugs into your Ethernet 802.2 or 802.3 network via your choice of a 10Base-T interface or an attachment unit interface (AUI), both of which are built in. If you have a coax-based network, you'll need an AUI-to-BNC transceiver (which we used in our test configuration). You can purchase a Token Ring, FDDI, or 100Mbps Ethernet (100Base-T) upgrade for an additional cost.

StorageExpress also required us to install its Central Console, a client-based comprehensive server backup, restore, and job monitoring program, which uses a pushbutton-style menu system that eliminates the confusion of having too many pull-down menu options.

The streamlined backup feature can be used to create one job that performs full and differential backups on specified days of the week.

PERFORMANCE

Setup

Setup was relatively easy considering the number of steps involved. The whole procedure took about an hour, including unpacking time.

Getting started with StorageExpress involves two different setup procedures: the hardware configuration and the software installation. We began by following the picture-heavy hardware setup cheat sheet, which explained where the cables belonged. No problems there. Software that was preinstalled on the server started up when the device was turned on for the first time. It asked what types of Ethernet network and frames we had, then said it needed to connect to the Central Console program for some configuration information. To facilitate this, we had to install Central Console on a client workstation.

The software installation for Central Console went smoothly. When we ran the program the first time, it "synched up" with the hardware. The box decided that they were set up with the same version of the StorageExpress system, so the device rebooted itself. After a few minutes, the system was ready for use.

We rate installation and setup very good.

Backup

StorageExpress backed up our 274MB sample file from a NetWare 4.02 server in 51 minutes, 13 seconds, which was faster than ARCserve for NetWare, the winner of our July 1994 comparison. But that comparison used 8mm Exabyte tapes, which can store 5GB of uncompressed data, compared to 2GB for the tapes that StorageExpress uses. The DATs used with StorageExpress are about a third the physical size of one 8mm tape.

Restore

StorageExpress' DAT unit really suffered in this comparison to ARCserve using 8mm tape. Where StorageExpress took 19 minutes, 28 seconds to restore the data, ARCserve finished the task in a speedy 6 minutes, 48 seconds.

Automation and scheduling

StorageExpress provides flexible, easy-to-use job scheduling, but it is possible to delete queued-up jobs without actually halting the operation, which hurt the product's score.

Overall, we found the software largely easy to figure out without documentation. The StorageExpress system allowed us to schedule a job to run immediately or at a future time. Since the StorageExpress hardware (rather than the server or the workstation) actually controls the job, we didn't have to leave Central Console or a scheduler application running on another machine as services. As long as all servers to be backed up are running and all appropriate volumes are mounted, and as long as all workstations to be backed up are running the appropriate agent, the backup job can complete successfully. The software also gets extra credit for providing disk grooming, a way of removing files no longer being used.

The job schedule viewing interface is simple enough, but we noticed one significant flaw. It is possible to delete a job from the queue without canceling it, meaning the job will continue running. Since it is no longer in the scheduler, there's no easy way to stop it. Still, we rate automation and scheduling good.

Error recovery

StorageExpress recovered gracefully from our recovery tests. First, to simulate a power outage, we turned the DAT drive off, then back on. The server software continued to run. As we expected, StorageExpress left a clear log of the tape write errors and SCSI time-outs that followed, then marked the job incomplete.

Our second test was to provoke StorageExpress with a damaged tape. (We poked a hole in the tape to damage it.) Not only did the system not crash, but it formatted the tape for use as if nothing were wrong — not an ideal situation.

Many of our troubles occurred during the streamlined backup process. During initial experimentation with this feature, we tried out a few options that we wanted to revoke. So we deleted the job from the queue before it actually ran and recreated it. The job we recreated did not run immediately even though we scheduled it to do so. Technical support told us to cold-boot the unit and use a fresh tape, which was formatted on the fly and worked fine.

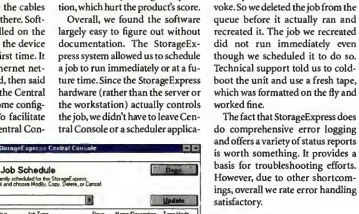
The fact that StorageExpress does no comprehensive error logging and offers a variety of status reports is worth something. It provides a basis for troubleshooting efforts. However, due to other shortcomings, overall we rate error handling satisfactory.

Tape rotation schemes

StorageExpress does allow you to customize your system of backup management, but it lacks the variety of backup schemes found with other products, such as Network Archivist from Palindrome Corp.

Such schemes involve removing tapes from the cycle on a weekly and monthly basis in order to preserve the state of the system at that time. You can do this manually with StorageExpress if you wish, by not specifying particular named tapes to be used during the process and simply remembering to swap and store tapes at appropriate junctures.

In addition, we were able to create a series of custom jobs to be run at specific intervals, such as weekly and monthly. We told our custom jobs to require tapes with certain names so that StorageExpress



THE JOB SCHEDULE VIEWER *in StorageExpress shows overview and status information for all running and scheduled jobs.*

Benchmarks

Times in hours:minutes:seconds

	Storage Express 1.40.A.E.	PREVIOUSLY REVIEWED* ARCserve for NetWare Version 5.01
Backup		
Server backup	0:51:13	0:54:32
Client backup	0:18:43	0:16:48
Restore		
Server restore	0:19:28	0:06:46
Client restore	0:29:03	0:25:18
Single file restore	0:00:34	0:01:03

*Reviewed July 4, 1994, page 52.

Report Card

Intel StorageExpress
Version 1.40.A.E.

Criteria	Weighting	Score	
Performance			
Setup	100	Very Good	75.00
BACKUP			
Server score	100	100.00	
Client score	25	22.45	
RESTORE			
Server score	150	52.16	
Client score	50	43.53	
Single-file score	25	25.00	
Automation and scheduling	100	Good	62.50
Error recovery	75	Satisfactory	37.50
Tape rotation schemes	75	Good	46.88
Support and value			
Documentation	75	Very Good	56.25
Support policies	50	Good	31.25
Technical support	75	Satisfactory	37.50
Value	100	Very Good	75.00
Final score			**6.7**

would expect or request the right tapes at the right times. However, StorageExpress does not fully automate tape rotation. As a result, we rate it good in this category.

Documentation

StorageExpress' documentation has improved greatly since Version 1.3. Several manuals have been shortened and incorporated into a single one, although some topics (such as technical support information) are still included in separate books and booklets. The manuals as a whole are logically organized and very usable. As for on-line help, it is attractive, informative on most topics we looked up, and context sensitive. We rate documentation very good.

Support policies

Live technical support is available at no charge but requires a toll call. Hours are from 7 a.m. to 5 p.m. Pacific time, Monday through Friday. Intel also provides a BBS, a CompuServe forum, and Internet access to a technical database. Intel also offers a 24-hour FaxBack number, which gets you into an automated system that can return various types of technical information to your fax machine. This can be great if you're fishing for optimization info, but it's rarely useful in a true pinch.

The warranty — especially relevant for a system with hardware components — is good for one year. We rate Intel's support policies for this product good.

Technical support

Compared to technical support lines for other products like this, Intel's was pretty quick.

When we called the support line, we had to go through a couple of automated prompts. When we got into the right queue, the phone was answered immediately by a dispatcher. She asked a few questions and gave us a case number. Then we were put back on hold for a couple of minutes, and then a technician came on the line.

The technicians were obviously intimately familiar with the product, and they were reasonably quick in coming up with answers to our questions. They were polite but not completely accurate in their diagnoses. When we were trying to connect to the StorageExpress unit from the workstation, we received an "integer divide by zero" crash message from Central Console. Tech support told us the fault lay with our version of the NetWare workstation drivers. We spent 2 hours locating, downloading, and configuring new drivers, which did not fix the problem. Ultimately, we changed the Ethernet frame type we were using, which corrected the problem.

We were able to use a synthesis of their ideas and our own to come up with solutions. We rate technical support satisfactory.

Value

This criterion indicates how well the product's capabilities are in line with its price, and how well that price matches the rest of the market.

There's no two ways about it: StorageExpress is expensive. It is well out of the reach of most small businesses that only have a few machines to back up.

For a business that can really make use of its capacity, such as one doing a lot of imaging or storage of real-time data, we rate value very good.

Robert Gryphon is a consultant and freelance writer in Redmond, Wash. He writes on a variety of computer-related topics, including networking and database development.

■ **Product summary**

Intel StorageExpress XLC

Version 1.40.A.E
Intel Corp.
Hillsboro, Ore.
(800) 628-8686 or (503) 629-7354

StorageExpress' high-capacity DAT backup makes it an attractive stand-alone solution for LANs, despite a few shortcomings and flaws.

List price: $13,495

Requires: Ethernet, 100Base-T, Token Ring, or FDDI LAN connection, depending on configuration. Servers' network operating systems must be NetWare 2.15 or later. Windows-based backup control software requires Windows 3.1 or later with recent NetWare shell drivers; 386 or better; VGA or better; 6MB of hard disk space; 4MB of RAM.

Pros: High-capacity backup on a small tape; 100Mbps LAN option adds speed; complete hardware and software solution.

Cons: Outperformed by 8mm tape backup systems; pricey for small networks; experienced several problems.

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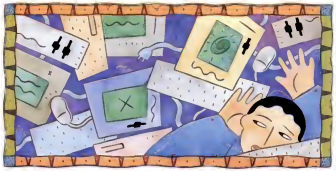

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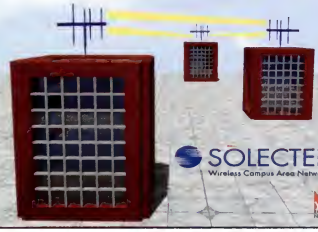

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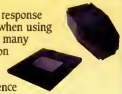

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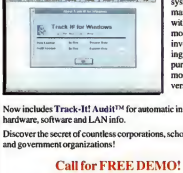

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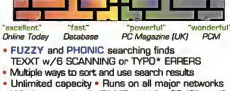

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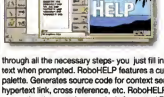

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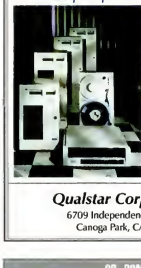

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The purpose of the fan is to keep the computer cool. Just like men in the Kinsey Report, electrical components perform better under cold conditions than hot. So it may be a good idea to keep your computer out of direct sunlight — and keep your meltable disks out of the sun as well. Even for security reasons, try not to place computers directly beneath a window. (I've seen too many computers disappear from various offices thanks to the old smash-n-grab.)

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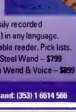

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Upcoming in InfoWorld

FEBRUARY 6 PRODUCT COMPARISON *PORTABLE GUI FRAMEWORKS:* We didn't find any magic bullets, but we did discover that these products save you a lot of work when you want to put the same interface on multiple platforms. We finish our two-part series on these tools with evaluations of Zinc Application Framework from Zinc Software Inc. and Wndx GUI Development System from Wndx Corp.

ENTERPRISE *FEATURE:* One way to reduce training costs and help-desk headaches is to document custom applications well. Although documentation tends to be an afterthought, success of an application rollout is often tied to incorporating it into the whole programming process.

FEBRUARY 13 PRODUCT COMPARISON *NETWORK ANTI-VIRUS SOFTWARE:* Which server application catches the most viruses? We compare five products: Symantec's Central Point Anti-Virus 2.5 for NetWare and Norton AntiVirus for NetWare v. 1.0, S&S Software's Dr. Solomon's Anti-Virus Toolkit for NetWare, v. 6.69, Cheyenne's InocuLAN for NetWare v. 3.0, and Intel's LANDesk Virus Protect 2.1, plus the beta of NetShield 2.0 from McAfee Associates.

ENTERPRISE *FEATURE:* Vendors across the map are promoting workgroup capability, but the first step for any business will be in deciding which programming interfaces to support. Typically, each vendor has its own approach, dubbed a standard. Choosing one may lock you out of others. We look at the options, the players, and the benefits of different approaches.

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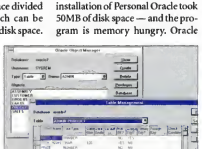
▸ Application development

Oracle duo addresses personal use, OLE

■ Personal Oracle brings relational databases to the desktop; Oracle Objects needs more work

By Susan Ryan With its recent announcement of Workgroup/2000, Oracle Corp. is trying to offer a complete solution from the desktop to the data center at a very competitive price. (See "Oracle to unveil long-awaited Workgroup/2000," Jan. 16, page 27.) However, after installing the beta of Personal Oracle, Version 7, I could only imagine a few narrow applications that might warrant the purchase of a full-fledged relational database for a stand-alone Windows machine.

Personal Oracle offers full Oracle7 functionality, including support for multiple instances of the database as well as the usual tablespace structure (disk space divided into logical units), which can be expanded to the limit of disk space. There are also new ease-of-use features aimed at minimizing the need for a specialized database administrator. Users will welcome these GUI-oriented management utilities that make the more cumbersome SQL Plus commands much easier to use.



PERSONAL ORACLE'S *Object Manager allows the database administrator or object owner to examine and alter elements such as tables, views, and indexes.*

The Database Manager starts up and shuts down the database and allows the database administrator to view and alter various database parameters, such as control files and cursors. The Database Expander gives both numeric and graphical representations of space usage. This utility would be even more useful if it had some intelligence to help the database administrator determine when expansion is a good idea. Object Manager, not to be confused with Oracle Objects, allows the owner or database administrator to create and alter tables and indexes. This is by far the easiest way to create tables. All of these utilities would be even better if they were combined into one utility, with access dependent on the user's level of database privileges.

This functionality does not come without cost, however. The basic installation of Personal Oracle took 50MB of disk space — and the program is memory hungry. Oracle recommends a minimum of 16MB, and more will certainly help.

The packaging of Personal Oracle seems to suffer from a split personality. The Personal Oracle database is there, but some of the ancillary tools in Oracle7 are missing. I did find Pro C, the library of C functions for gaining access to Oracle databases, but not SQL Forms, which is part of Oracle's Cooperative Development Environment, or SQL Report Writer. Also, there's documentation for SQLNet, but no SQLNet icon. (SQLNet, SQL Forms, and SQL Report Writer are available as add-ons.)

One serious flaw is actually according to plan. There is no paper documentation other than the thin book "Oracle7 for Windows Installation and User's Guide." Everything else is on-line. Although this certainly is a side effect of Oracle's extremely aggressive pricing, it is a mistake. The more complex a product is, the more it needs paper documentation.

The product I tested was a beta, and naturally there were some beta bugs, particularly when there were other applications running at the same time. Microsoft Word and Personal Oracle seemed to conflict and crashed the machine occasionally. The production version, due to ship this week, should be better behaved.

Oracle is distributing Personal Oracle via the Internet as well as on CD. You can call Oracle and get a CD shipped the next day for a 90-day trial. If you have access to the Internet and a World Wide Web client, you can find Oracle's Home page at www.oracle.com.

Oracle Objects for OLE

Oracle Corp.'s view is that although enterprises are slowly moving their applications to the object-oriented model, they also have a lot of data in relational databases that isn't moving anywhere.

Oracle Objects is a way of dynamically accessing data in Oracle databases from Borland International Inc.'s Borland C++ or Microsoft Corp.'s Visual Basic, Excel, Visual C++, or Access. In Visual Basic, for example, Oracle Objects operates as Oracle Data Control and supports Visual Basic custom controls. In C++ packages, it works as the Oracle Objects for OLE C++ Class Library. But you don't need to know anything about programming in OLE to use these libraries.

I gave Oracle Objects a test drive in Borland C++. I tried to take the same approach a developer would: I added some simple Oracle Objects code to a basic C++ application. After considerable difficulty, I did manage to get some small applications compiling, linking, and even running. (For more detail, see Down to the Wire, page 105.) It's a good thing I had access to some of the folk who developed Oracle Objects.

The worst part of this entire process was that none of these problems stemmed from any inherent defects in concept or in the base code. The idea is good, and much of the implementation is good as well. When you can get an application to run, it's quick — faster than normal OLE. Most of the problems I had stemmed from the fact that this product was released too early. And I'm not talking about beta problems; the shipping version, due this week, will have only minor changes from the package I tested, according to Oracle.

BETA

This product, much more than Personal Oracle, suffers from lack of paper documentation. Going back and forth between my source code and on-line help, searching for definitions of classes and their methods was frustrating and inconvenient.

The fact that the on-line documentation was incomplete and sometimes inaccurate only added insult to injury. It was enough to make me wonder if I'd misunderstood the Workgroup/2000 slogan "Proof that you can." I think it's really "Prove that you can."

Once the product works, it works pretty well. It's a shame if poor project scheduling led to the release of a not-quite-ready product when a little more time would have made it usable and polished.

Oracle Objects for OLE is bundled with Personal Oracle. The shipping version is also available separately on CD or via World Wide Web at www.oracle.com for a 90-day trial.

Opinion: ☺

Personal Oracle

Version 7

Oracle Corp., Redwood Shores, Calif. (800) 492-9870, (415) 506-4176; fax: (415) 506-7000

Price: $399 (includes Oracle Objects for OLE)

Pros: Full functionality; good administration tools.

Cons: No hard-copy documentation; overfill on Windows platform.

Opinion: ☺

Oracle Objects for OLE

Version 1.0

Oracle Corp., Redwood Shores, Calif. (800) 492-9870, (415) 506-4176; fax: (415) 506-7000

Price: $199 ($399 with Personal Oracle)

Pros: Good idea; faster than normal OLE.

Cons: Lack of documentation is a fatal flaw; extremely difficult to make work under C++.

Opinions
☺ Terrific
☺ OK
☹ Troubling

▸ Laser printer

On the network or the desktop, Lexmark's Optra L is superior

By Jill Welch

In testing Lexmark International Inc.'s Lexmark Optra L, I found it to be one of the easiest-to-use laser printers I have seen. The design is not nearly as bulky as that of most network printers, and the control panel actually makes sense, with no more embedded menus that leave even the most savvy user in a state of confusion. It ships with Lexmark's MarkVision software utility, which allows the user to graphically monitor and configure the printer.

Capable of printing up to 1,200 dpi, it handles gray-scale photos with pleasing contrast and detail. The Optra L ships with 4MB of RAM, but if you're going to print high-end photographic images at 1,200 dpi, you should upgrade to at least 8MB. 64MB is the maximum memory amount.

The Optra L is chock-full of features. It ships with PCL5 and PostScript Level 2 emulation; resolutions include 300, 600, and 1,200 dpi. It is rated at 12 pages per minute (ppm), but when printing at 1,200 dpi, the speed drops to 8 ppm. I noticed a significant speed reduction when printing a gray-scale .TIF image at 1,200 dpi.

The Optra L ships with a 500-page input tray. Ethernet, LocalTalk, and Token Ring interfaces can be purchased as options. Automatic interface and emulation switching are standard. There are two slots for network adapters.

Considering its price and capabilities, the Optra L should give Hewlett-Packard Co.'s HP LaserJet 4Si a healthy run for IS managers' money.

Opinion: ☺

Lexmark Optra L

Lexmark International Inc., Lexington, Ky. (800) 891-0331, (606) 232-2000; fax: (606) 232-2380

Price: $2,299 with 4MB of RAM

Pros: Superior output; intuitive design.

Cons: None significant.

▸ Unix operating environment

NextStep, SoftPC worth a look by Windows users

Current users get a good upgrade

By Laura Wonnacott

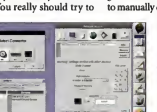
IT'S HIGHLY UNLIKELY that the recent NextStep, Release 3.3, for Intel systems will give birth to a revolution in the desktop OS market and convert a lot of Macintosh, DOS, Windows, OS/2, or other Unix hounds to Next Computer Inc.'s terrific product. Certainly, NextStep 3.3 will attract new users with its sharp object-oriented operating and development environment, but the release is designed primarily for NextStep's current customers.

Many NextStep users will gain by moving to Release 3.3, especially those in large-scale corporate networks. As the sole NextStep user at *InfoWorld*, I was pleasantly surprised with the new offerings, which address many issues — including speed, ease of use, interoperability, deployment, and scalability.

Now, where's that child?

Installing NextStep 3.3 is child's play. That is, it's child's play once you've assembled the resources necessary to get NextStep running. NextStep is as hungry as Uncle Sam in April, requiring 24MB of RAM and a 486 to support its 32-bit color display. If you're willing to settle for (far) less, you can run in monochrome mode with "just" 8MB of RAM.

I installed NextStep 3.3 on an Epson 486-33 Progression with 32MB of RAM. To kick off the installation, you simply boot to the Install disk and select the driver for your SCSI adapter, and you're ready to sit back and relax. You really should try to



NEXTSTEP'S CONFIGURE *application detects conflicting IRQs, with no need for jargon.*

relax at this point, as it took me a couple of hours to finish installation. NextStep now supports 8-bit gray scale, which will certainly attract NextSteppers who want to run on a notebook. NextStep 3.3 even supports APM (Advanced Power Management) on notebooks. NextStep 3.3 includes much more adapter support, including support for BusLogic Inc. SCSI adapters, a host of new PCI network interface cards, and video drivers. This release is more Intel-enabled: It supports PCMCIA, ISA Plug and Play, and PCI Plug and Play.

NextStep 3.3 contains the best configuration utility I've seen in any desktop operating system. The configure application starts automatically at the completion of the installation. No need to know complicated networking acronyms such as BNC, AUI, or RJ-45. You just click on the graphical representation of the port you want to use on the network card. The configure application also displays the IRQs of all devices and marks those already claimed. If you create a conflict between two devices, a conflict resolution dialog pops up. For the Unix gurus, an expert option allows you to manually configure advanced parameters, such as boot options.

Once configured, NextStep's Simple Network Starter is just that — simple. It's so simple that it's hard to believe the underlying OS is Unix. As in other Unix desktops, TCP/IP is the default transport. Within minutes, I entered all the required IP information, restarted the system, downloaded a Web browser (OmniWeb) and news reader (Newsgrazer) from a favorite FTP site and was surfing the Internet. In addition to TCP/IP, I quickly enabled NetWare on my desktop by using NextStep's NetWare Manager Application. I immediately noticed a tremendous improvement in NetWare file access. (Next says it has made significant enhancements in the kernel. Sure looks like it to me.) NextStep provides smooth integration between the desktop and the NetWare environment.

Scaling the enterprise

NextStep 3.3 offers considerable improvements in scalability and enterprisewide deployment. A new application, Net Install Helper, allows you to create a custom configuration boot disk for a particular client and installs the client over the network via a Network File System server. The User Manager and NetInfo Manager applications have also been improved. For example, I used the new Bulk Add and Delete feature in User Manager to create a group of users within seconds. Creating custom user templates and domain-based settings is a snap.

NextStep's network administration database (NetInfo) can be distributed across multiple clone servers, which act as backup servers to mirror the contents of a main server. Changes to the main NetInfo database are distributed instantly to all clones, ensuring up-to-date network information. Bulk upgrades can be "pushed" (without client intervention) across the network to each workstation.

NextMail now supports Multipurpose Internet Mail Extensions (MIME). NextMail users can send and receive multimedia messages with other MIME mail users. Mail management has improved. A nifty little feature lets me mark a message as unread even after I've seen it.

SoftPC 4.0

NextStep 3.3 includes a 30-day free trial of SoftPC 4.0 from Insignia Solutions Inc. SoftPC is a NextStep application that enables MS-DOS and Windows and their applications to run under NextStep. SoftPC allows me to run Windows where it belongs — in a window. I can easily switch between Windows and the NextStep desktop, although cutting and pasting between the two desktops is still quite slow.

Earlier versions of SoftPC provided support for NetWare IPX, but the product was intolerably slow. The NetWare speed improvements I had already noticed in NextStep were present in SoftPC, too, but it's still not as fast as using Windows alone. (SoftPC 4.0 now hooks into the Next kernel for NetWare access, according to Next.)

Other welcome changes are that SoftPC 4.0 now supports Windows enhanced mode and has enhanced its TCP/IP support. SoftPC includes a Winsock-compliant TCP/IP interface, which includes a special DLL to provide a direct link to the NextStep TCP/IP stack and network driver. You can now use SoftPC with any network application that supports Winsock.

Now, on to Mecca — NextStep 4.0.

Opinion: ☺

NextStep
Release 3.3
Next Computer Inc., Redwood City, Calif.
(800) 879-6398, (415) 366-0900; fax: (415) 780-3714

Price: $799; upgrade costs $199.
Pros: Easy-to-use, object-oriented Unix OS. Includes SoftPC 4.0, which now supports Windows enhanced mode.
Con: Hefty system requirements.

▸ Presentation graphics

Novell's Presentations 3.0 is among the best in a crowded field

By Rich Grace

PRESENTATION GRAPHICS users have a strong new choice in this crowded field — Novell Inc.'s Presentations 3.0.

Though the previous version of the program, WordPerfect Presentations 2.0 for Windows, had virtually no presence in the market, Version 3.0 is not only substantially better than its predecessor, but it also proves to be a worthy competitor to any program in its class.

Presentations 3.0 has added many ease-of-use features. Embracing the Wizards metaphor pioneered by Microsoft Corp.'s PowerPoint, Presentations now offers eight Coaches to help beginning users create and format slide shows. Coaches lead users through tasks using pull-down menus and dialog boxes, pointing out each step as the user proceeds. Though the coaching logic isn't perfect (I managed to get it to misdirect me with a three-dimensional charting feature when I had created a two-dimensional chart), it's an innovative idea that does a much better job of teaching users how to use the product than does Microsoft's approach.

Outlining is greatly improved. The outline view resembles a sheet of notebook paper, with outline text now directly applied to slides, and offers the capability to import WordPerfect text. Presentations makes heavy use of the right mouse button, which can be clicked on many slide objects to open editing features.

Presentations 3.0 integrates an OLE 2.0 charting engine. Presentations' charts match and beat PowerPoint's in both selection and customization, with 60 2-D and 48 3-D chart types. There are also 3-D geometric shapes for columns and bars, with different lighting directions and shading. New tools for creating organizational charts offer 20 basic chart types, with the capability to expand and edit them within the program.

Presentations makes good but incomplete use of OLE 2.0. You can insert Presentations chart objects and bit maps into OLE 2.0–compliant programs, and any object type in the Windows OLE registry can be placed into a slide show. But you can't embed entire slides into documents from other programs (such as Microsoft Word). Dragging and dropping of slides can only be done among Presentations files. (I did not test this feature with other Novell PerfectOffice applications.) Among Presentations 3.0's best qualities is its modest use of system resources — roughly 15 percent with two graphics-heavy files opened. For a presentation program, that's remarkable.

Some inconveniences crop up while using the program: The Undo and Redo features can't be used for many basic tasks; you can't delete bullets in Outline or Slide view by using the mouse, but have to use the Backspace or Delete keys; and choosing bullet styles for lists can be confusing.

Despite these caveats, Presentations 3.0 rewards both the beginner and the experienced user. The program's depth of features is greater than most of its rivals' and offers more control over data types than its previous version. As an experienced PowerPoint user, I'd use Presentations 3.0 for the charting features alone.

Opinion: ☺

Presentations
Version 3.0
Novell Inc., Orem, Utah
(800) 451-5151, (801) 225-5000; fax: (801) 222-5077

Price: $395
Pros: Coaches help users complete tasks; strong outlining, charting.
Cons: Can't use mouse for some actions; undo feature not always available; help is inadequate in some areas.

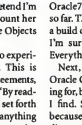
Rich Grace is the author of several books on presentation graphics and word processing software. His Internet address is 72672.2266@compuserve.com.

DOWN TO THE WIRE · NICHOLAS PETRELEY

Seeking a comfort factor (while treading carefully) in testing Oracle Objects

WAY BACK WHEN Woody Allen was doing stand-up comedy, he did a shtick about a near-death experience. When it happened, he saw flashbacks of a child playing at the ol' swimmin' hole, fryin' up a mess o' catfish, and so on. Then suddenly he realized that these weren't flashbacks of his life. He was having a near-death experience, and somebody else's life was flashing before his eyes.

Now, Down to the Wire is supposed to be a diary of my experiences in the *InfoWorld* Test Center. The problem is, this week was an endless string of meetings, the kind of experiences you'd best not know anything about. The only thing more boring is a weekend in a sensory deprivation tank.



I'm beside myself

This week, my experiences will have to be someone else's. So I've decided to pretend I'm senior analyst Susan Ryan and recount her experiences with the beta of Oracle Objects for OLE.

Oracle products, regardless of who experiences them, are always exciting. This is primarily because Oracle license agreements, when loosely translated, amount to "By reading this you are accepting the terms set forth that you will not in any way publish anything but glowing praise for this product or else we'll sic our lawyers on you so fast it'll make your head spin." During the final week of a recent database server comparison, for example, Oracle threatened to withdraw its consent for our publishing Oracle7 benchmarks unless we could give them "a comfort factor" that the numbers we would print couldn't be used by the competition to make them look bad. Then they followed up with a lawsuit threat because we wouldn't call our printer and have it white out the Oracle sections of the comparison before sending out the issues. It turns out that, as the numbers didn't make Oracle look bad at all, the matter seems to have been dropped.

Anyway, right now we're trying to get a comfort factor for Oracle Objects, which is supposedly connected somehow with the larger Oracle Workgroup/2000 line of products. The name is a pretty clever idea if the 2000 is referring to the year 2000, by the way. It leaves a lot more room for error than Microsoft's Windows 95.

First, I (ahem, meaning Ms. Ryan) install Oracle7, then Oracle Objects. No problems so far. Then I install Borland C++ 4.0 and do a build on some of Borland's sample code so I'm sure I've got it configured properly. Everything is looking good.

Next, I'll look for some sample code for Oracle Objects. OOP code is what I'm looking for, but "oops" would better describe what I find. Some of the samples aren't. That's because some of the code in the "samples" directory is empty, and much of the rest is (by Oracle's own admission in the code comments) buggy. Even the help screens are missing sample code, though you can see some empty space where it should eventually go.

All right, this is all typical for a beta product, but it isn't going to make progress any easier.

Header off at the pass

I dig and finally find something I can compile. Let's give it a shot. The compiler tells me it can't find the prototypes for just under a zillion functions. This is the sort of thing you get when you forget to include some header files in your source code. But as far as I can tell, I haven't left out any headers.

OK, being on deadline and unwilling to fiddle endlessly with header definitions, I call the product manager. He's not in. I get fobbed off onto a developer. Oracle Objects isn't his area of specialty, so he isn't a lot of help.

I fiddle with it a bit more and manage to resolve some, but not all of the problems, I call back the developer, who by now is clearly annoyed that my problems are somehow being foisted upon him. For my trouble, I am advised that the product manager is back and that I should call him. So I do, and leave voice mail.

I don't hear back. OK, umpteenth time's a charm. I call again, and this time I find out there is some off-site meeting going on that is occupying the entire team. But I've gotten lucky. I managed to catch the very last geek as he's stepping out the door.

While discussing the sample code, this fellow discovers a completely unrelated problem. The sample doesn't include the OStart-Up or OShutDown functions. This means that even if I were able to compile this code (I still can't), it wouldn't do anything anyway, because it isn't starting up the database. But outside of discovering that oversight, I can't seem to get it to resolve the unknown functions.

Maybe Oracle doesn't understand Borland C++. I give up on it and install Microsoft Visual C++. I play around with a few of Microsoft's sample programs to make sure that I have everything set up properly. Then I add a little Oracle code to a very simple Visual C++ sample. All it does is open a database. Naturally, I include the gamut of header files and set the proper include and library paths.

Bzzzt! Thank you for playing. I get another zillion compiler errors about unresolved functions. Deja vu.

I reach for the keyboard and I'm about to write my First Look, starting with "Nice idea — doesn't work," when all of a sudden Oracle calls back. After considerable time on the phone, the chief objects geek and I discover that all the functions are resolved if we eliminate a header file omfc.h, which we would assume is Oracle's Microsoft Foundation Classes header.

Finally, we can get through a compile. But it still doesn't link properly. He tells me the various tweaks to make the rest work: Move a DLL file from one directory to another higher up in the directory tree; include some more OLE libraries in the linker specification; turn on the "ignore default libraries" option; and add another library to the linker path. Most of these instructions are documented in the same place many of the meetings I attend go — namely, nowhere.

It wasn't a total waste. It turns out Oracle Objects isn't all that bad once you can get it to compile. And, after all, at least I found out what it was like to be Susan for a week.

All the fun and none of the surgery. Send E-mail to either susan_ryan@infoworld.com, nicholas_petreley@infoworld.com, or CompuServe 71333,426.

▸ **Network management software**

Norton Administrator 1.5 adds inventory for Mac, OS/2 clients

By Robert Gryphon

AS ITS NAME SUGGESTS, Norton Administrator for Networks, from Symantec Corp., helps network administrators perform various workstation management tasks. It combines the functions of hardware and software inventory, remote software distribution, and application metering into a system bound together by a tight and attractive administrative interface.

One of Norton Administrator's distinguishing characteristics is its support for, in the company's words, "heterogeneous environments." This means it can be used with several of today's major network operating systems (NOSes): NetWare, Windows NT Advanced Server, Microsoft LAN Manager, IBM LAN Server, Banyan Vines, and now, Digital Pathworks and AppleTalk. (All this really means is that the system knows how to map drives to those operating systems; there are no low-level NOS-dependent calls.)

Opinion: ☺

Norton Administrator for Networks
Version 1.5
Symantec Corp., Cupertino, Calif.
(800) 441-7234, (408) 253-9600;
fax: (503) 334-7474

Price: Ranges from $65 per node for five users to $44 per node for 1,000 users
Pros: Broad client and network support in well-integrated workstation management package.
Cons: Limited functionality on Mac, OS/2 clients.

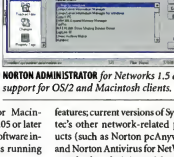
InfoWorld looked at Norton Administrator 1.0 more than a year ago (see review, Nov. 8, 1993, page 96). Since that release there have been only a few changes, with no major features added. One of the main differences is that Version 1.5 adds hardware and software inventory and software distribution support for Macintoshes running System 6.05 or later and adds hardware and software inventory for workstations running OS/2 2.0 or later.

The Windows console manages the Windows, DOS, and OS/2 client features; current versions of Symantec's other network-related products (such as Norton pcAnywhere and Norton Antivirus for NetWare) can also be administered from this interface.

The new Macintosh console (for System 7.0 or later) manages the Mac clients. This interface does the job, though it's not as fancy as the Windows version. Application metering is not supported on Mac or OS/2 clients, as Symantec has yet to develop workstation metering agents for those platforms.

If you're in the market for a medium-priced network administration tool that covers several platforms and features many of the capabilities found in the costliest packages, take a close look at Norton Administrator.

Robert Gryphon is a Redmond, Wash.-based consultant. He writes on a variety of computer-related topics. He can be reached via the Internet at 70541.3420@compuserve.com.



NORTON ADMINISTRATOR *for Networks 1.5 adds support for OS/2 and Macintosh clients.*

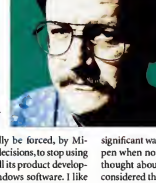
DISTRIBUTED THINKING · STEWART ALSOP

Consumers must be saved from Microsoft as well as its bumbling competition

I'M GOING TO TOSS MY VOTE into the hat on the question posed by Bob Metcalfe several weeks ago: Should Microsoft be allowed to buy Intuit? (See From the Ether, Dec. 12, 1994, page 59.) Our readers voted 2-to-1 against allowing the acquisition to go forward. And I concur with the majority: I think it would be a mistake for our industry and for our society to let Microsoft acquire a dominant position in personal financial and tax preparation software by acquisition.

I've read the white paper written by attorneys at Wilson Sonsini Goodrich & Rosati, which argues against the acquisition on the grounds that it is fundamentally anticompetitive and will only help Microsoft eliminate one more viable competitor in its self-admitted course toward dominating every significant sector of the software business. (I read this courtesy of *Upside* magazine, which managed to acquire a copy of the white paper, previously undistributed except to the Justice Department and the unnamed companies that financed development of the white paper. It is published in the February issue of *Upside*. For the full text, see *Upside*'s Home page on the World Wide Web at http://www.upside.com/upside/upside.html).

Partly, my belief comes from the very persuasive arguments in this white paper and my own knowledge of how Microsoft, Intuit, and the software industry work. But, just as much, I do not want Microsoft to own Intuit because I use Intuit's Quicken product on the Macintosh and I do not want Microsoft to be in charge of continuing development of Mac software I use. I believe I will eventually be forced, by Microsoft's development decisions, to stop using a Macintosh, because all its product development favors using Windows software. I like choices, and I see my choices being continually reduced — to the point where this is now a social and political issue and not just a product and competitive issue.



The white paper argues that, based on Microsoft's past development and marketing strategies for operating systems (including both DOS and Windows) and applications (for the components of Microsoft Office) as well as on its current efforts with OLE, Windows 95, Windows NT, Back Office, tools such as C++ and Visual Basic, and the Microsoft Network, the result is that Microsoft will get control of every significant piece of the desktops and servers in corporations, homes, and the information superhighway, including possibly even control over the information distributed to consumers.

This is difficult even to debate now. Three weeks ago, Bill Gates and I jointly evaluated every single competitor that Microsoft faces: IBM in operating systems for both desktops and servers; Apple in operating systems for desktops; Novell in operating systems for networks and applications for both desktops and networks; Lotus in applications for desktops and networks; AT&T in applications for networks and in electronic services; CompuServe, America Online, and Prodigy in electronic services. We concluded by agreeing that the strategies being employed by each of the competitors was flawed in one or more significant ways. I asked Bill what would happen when no one else was left standing. He thought about that and said that he'd never considered that possibility.

I believe him. I know Microsoft and Bill Gates well enough to know that the company has not developed a grand plan to eliminate the competition, because that would be "random," to use Gates' language. But Microsoft has been so focused on competing and winning in each market that it has achieved the same effect as if it had employed a grand strategy and used unfair tactics. The one difference is that Gates and his crew did not plan on his competitors being so consistently distracted by egos, stupidity, internal politics, and other "random" events. (Can anyone tell me why IBM is pitching OS/2 Warp as a home-computer operating system while Microsoft is busily investing in NT Advanced Server as the platform for Back Office?)

The white paper recommends that the Intuit acquisition be set aside, as is within the powers of the Justice Department. It also recommends that Microsoft be forced to disclose changes in its OSes to all application developers, including those that work for Microsoft, simultaneously so that its own developers do not get a 9-to-18-month lead in supporting these changes. This seems reasonable, but it should probably be implemented differently: We should force Microsoft to publicly document the interfaces for Windows 95 and other operating systems to such a degree that it is feasible for other companies to create their own, clean-room versions of Windows without having to purchase a license from Microsoft. That would create a competitive market for the underlying operating systems, in the same fashion that Intel must live with competition from AMD, Cyrix, Nexgen, and others. Microsoft would still get the opportunity to improve the operating system and take advantage of the lead time those changes give it before OS competitors can reproduce the same functionality.

It's not that Microsoft has to be punished for its success. Consumers need to be protected from the stupidity of Microsoft's competitors and guaranteed some choice in the future. For my own selfish purposes, I want Intuit to remain the Intuit I already do business with, not the Microsoft that foisted a weak port of Word for Windows on me or the Lotus that foisted a recompiled version of Notes for Windows on me.

Editor in chief Stewart Alsop welcomes comments and may be reached on the Internet at stewart_alsop@infoworld.com.

NOTES FROM THE FIELD · ROBERT X. CRINGELY

We would have known it was your birthday if only Schedule+ had let us in

THIS WAS SUPPOSED to have been my big birthday column, but I hear Alsop needed extra space this week to write about Microsoft, so there just isn't room. All I can say is that I am now 42 years old, don't feel a day over 41 and a half, and that for the next three weeks I'll be 18 years older than Pammy — a fact she reminds me of every 15 seconds or so. I, on the other hand, refuse to hold Pammy's youth against her. I'm perfectly willing to hold nearly everything else against her, just not her youth.

The empire strikes out

I've been worrying lately that *InfoWorld* is turning into *MicrosoftWorld*. About half the items in this column, for example, are about the boys and girls in Redmond. This is understandable, given that columns are for the most part reactive and Microsoft certainly has attained critical mass.

But empires eventually crumble as supply and communication lines get too long to be reliable. This is happening to Microsoft. More and more items in this column are not about specific product successes or failures, but problems with the giant system of related products and strategies.

Here's an example of what I mean. Say you are running Microsoft Mail and using Microsoft's Schedule+ software. Somebody inadvertently changes the MS Mail administrative password (it's easier than you think) or the file with that password becomes corrupted. You can recover your Mail messages if this happens, but the only way to recover associated Schedule+ entries is to send the entire schedule data file back to Microsoft, where it takes them "a few days" to recover the appointments for those 200 lawyers to whom you used to report.

Or perhaps you've bumped into the bug in Microsoft's Visual C 1.5x optimizing compiler, in which the number of allocated objects (*not* user controlled) is less than you need, causing a crash. Microsoft says to use the fast compiler instead of the optimizing compiler, though Microsoft ads tout the optimizing compiler as the reason to buy. Alternately, the kids in Redmond say, make sure all the classes you create have a destructor. But wait, there are classes without destructors within the Microsoft Foundation Classes, making this second option not an option at all. It would take one Microsoft programmer one day to make the appropriate Microsoft Foundation Class changes, but it isn't happening.

If that's too obscure, how about Microsoft's policy that Excel support Visual Basic API calls through the Visual Basic Applications engine? That's what the marketing materials say, but it doesn't work and Microsoft tech support admits it.

We have ways of making you type

Fortunately for Microsoft, other companies have just as much trouble bringing products to market. Apple, for example, was supposedly rushing to roll true multitasking into System 7.x in an attempt to blunt the impact of Windows 95. Then the problems with System 7.5's rushed rollout, combined with a few days of chanting the mantra "Mac users are loyal, Mac users are loyal," at Apple Intergalactic HQ resulted in the decision to let multitasking wait for System 8.0, which might not arrive until 1997, by which time Pammy will be running a SPARCstation. But the story I like best is about an IBM ThinkPad with a full-size fold-out keyboard. They built 200 test units last week and learned the interesting lesson that picking it up by the edge of the keyboard produces a 115-volt surprise.

NEXT WEEK: Pammy's revenge!

Don't ask me: we've been on very good terms lately. But please call me with an industry secret at (415) 342-0251; fax: (415) 342-8950; or cringe@infoworld.com.

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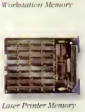

Laser Printer Memory

Kingston TECHNOLOGY CORPORATION

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